the OIL AND GAS JOURNAL

TECHNOLOGY DEPT.

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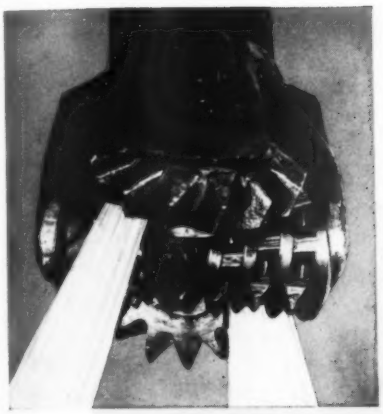
DETROIT



Different in Design

Different in Performance

REED

Liquid-blast

ROCK BITS

Liquid-Blast slush nozzles clean cutter teeth *and* the bottom of the hole, assuring faster penetration and more hole per bit.

Try Reed "LB" Rock Bits on your well right away.

REED ROLLER BIT COMPANY

HOUSTON 1, TEXAS

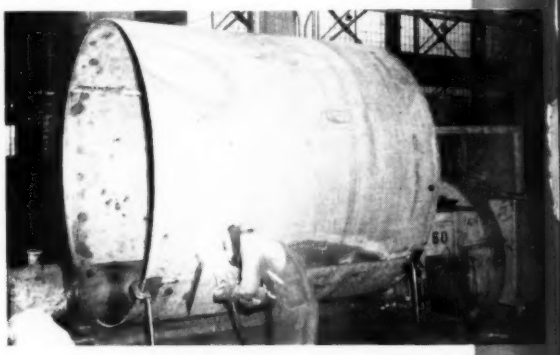
XUM

Building a Stainless Clad Steel FRACTIONATING COLUMN

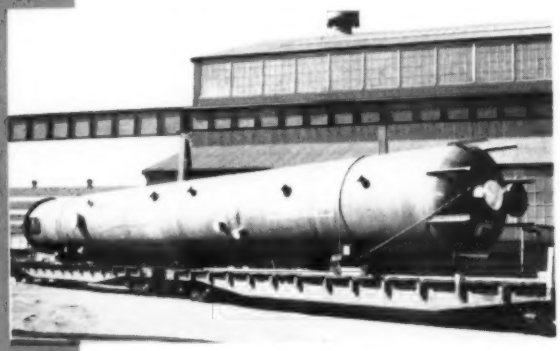
1. The cladding is being chipped back from the edge of the plate so that the mild steel weld will not be contaminated. Before this, the plates were marked and trimmed.

2. Two shell plates are being welded together with an automatic welding machine in this view. This process insures uniform quality of welds.

3. The shell plates are rolled to the proper radius. One longitudinal weld is already completed and the other edges of the plates have been prepared for welding.



4. When the plates forming each ring of the shell are rolled to the proper radius, the ends are tack welded manually. The welds themselves are made on automatic machines.



5. All finished and ready to roll. This refinery tower is 9-ft. in diameter by 69-ft. long. The lower 30-ft. is built of chrome clad steel, type 405.

THIS fractionating column is the main tower in a U.O.P. fluid catalytic cracking unit at a refinery in Michigan. In addition to the tower, we furnished a reactor-regenerator column, a stripper column, a stripper, and a catalyst storage hopper—all for use in this same catalytic cracking unit.

The accompanying views show that we know how to build the specialized structures needed in the petroleum industry. You act in your own best interest when you select an experienced fabricator. Let our nearest office supply quotations on your next job.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3 ..... 2154 Healey Bldg.
Birmingham, 1 ..... 1536 North 50th St.
Boston, 10 ..... 1025—201 Devonshire St.
Chicago, 4 ..... 2128 McCormick Bldg.
Cleveland, 15 ..... 2204 Guildhall Bldg.
Detroit, 26 ..... 1514 Lafayette Bldg.
Havana ..... 402 Ahrau Bldg.
Houston, 2 ..... 2119 National Standard Bldg.
Los Angeles, 17 ..... 1523 General Petroleum Bldg.
New York, 6 ..... 3347—165 Broadway Bldg.
Philadelphia, 3 ..... 1615-1700 Walnut Street Bldg.
Salt Lake City, 4 ..... 825 West 17th South St.
San Francisco, 11 ..... 1254—22 Battery Street Bldg.
Seattle, 1 ..... 1325 Henry Bldg.
Tulsa, 3 ..... 1606 Hunt Bldg.

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Compagnia Tecnica Industrie Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Comprimo N.V., Amsterdam—O, Netherlands

Let your records tell you!

It's no news that the true cost of wire rope cannot be reckoned by purchase price alone. As we've so often pointed out, the real cost is the cost per unit of work it does.

In the case of Bethlehem rope, this figure will be *low,* and you will therefore have an economical rope. But we strongly suggest that *you* prove this to your own satisfaction. Keep some simple records; something to show, for instance, the rope costs per ton-mile in oil-country drilling . . . or per car of coal hauled up a slope . . . or per cubic yard of rock moved, etc. Pick the most convenient unit of work applicable to your business. It isn't at all difficult or complicated.

Then, study your records every so often. They'll tell you, far more convincingly than we can, that Bethlehem wire rope is an *economical* rope.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910. at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950.

XUM

New Lorain-50 "Series" revolves on new TIMKEN® cone rollers

FOUR cone rollers in the new Lorain-50 "Series" of power shovels and cranes carry the weight of the entire upper structure including the bucket load.

The cone rollers are a new development of the Timken Company and assure a free, easy swing when the turntable revolves. Each cone roller is a complete Timken® tapered roller bearing—with inner races, rolls, cages, and outer race. It is the cone-shaped outer race of the Timken bearing itself upon which the turntable revolves. And like conventional Timken tapered roller bearings, the cone rollers take radial and thrust loads, have extra load carrying capacity and keep maintenance to a minimum.

Timken bearings take any combination of radial and thrust loads because of their tapered design. Line contact between rolls and races gives extra load-carrying capacity. And thanks to their true rolling motion and incredibly smooth surface finish, Timken bearings virtually eliminate friction. Shafts are held in positive alignment, reducing wear on surrounding parts.

Normally, Timken bearings last the life of the machine because they are (1) engineered for the job, (2) are made of Timken fine alloy steel, (3) are precision manufactured.

No other bearing offers *all* the advantages you get with Timken bearings. They have more than fifty years of bearing research and development behind them. Insist on Timken bearings in the machines you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address, "TIMROSCO".

This symbol on a product means its bearings are the best.

THEW SHOVEL COMPANY, *Lorain, Ohio, uses Timken cone rollers to insure long life and trouble-free performance in the swing mechanism of their Lorain-50 "Series" shovels. Notice the cone roller and bearing are integral, the roller itself serving as the outer race of the bearing.*

WE MAKE OUR OWN STEEL

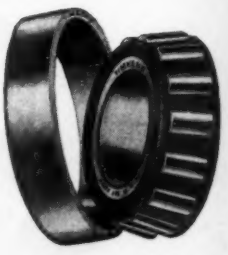
The special grade alloy steel which gives Timken bearings their strength and resistance to wear, is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

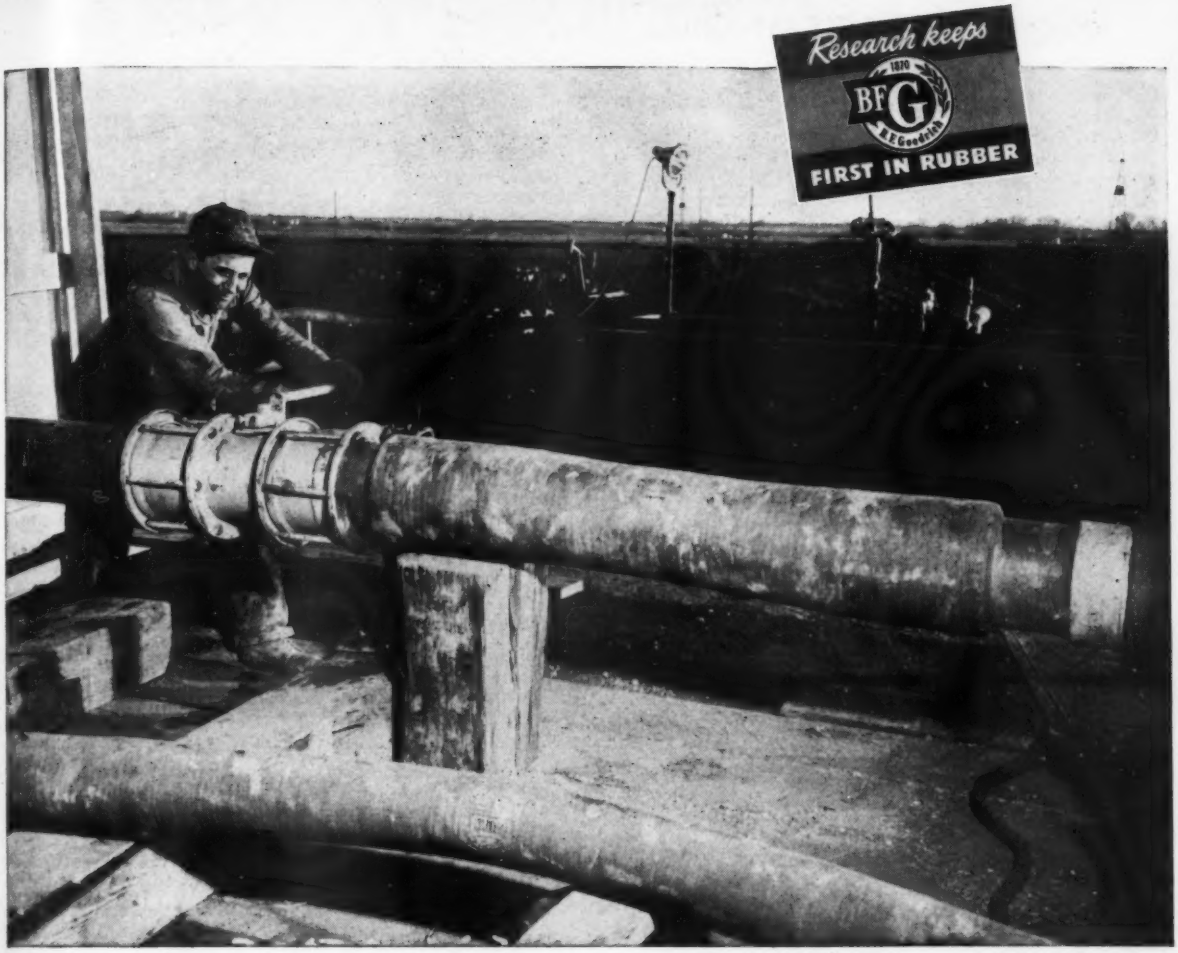
TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬮ AND THRUST →⬮← LOADS OR ANY COMBINATION ✳



Mud pump hose tough all over; tube would outwear steel

B. F. Goodrich mud pump hose has smooth-bore tube of Armorite

COVER, tube, reinforcements — all have been improved by B. F. Goodrich to build a mud pump suction hose to take more rough wear than any hose you've ever used.

Smooth, tough tube — B. F. Goodrich mud pump suction hose has a tube made of Armorite, a rubber developed by B. F. Goodrich and proved in service to have the highest abrasion resistance of any known rubber — actually outwears steel in many applications. Tube is as smooth as a gun barrel, keeps mud going through at high speed without roughening the surface.

Roughneck cover — It's practically abrasion-proof. Move it from job to job, drag it into position, load it into a truck — but be sure it's B. F. Goodrich hose with its extra-tough cover for extra-hard service.

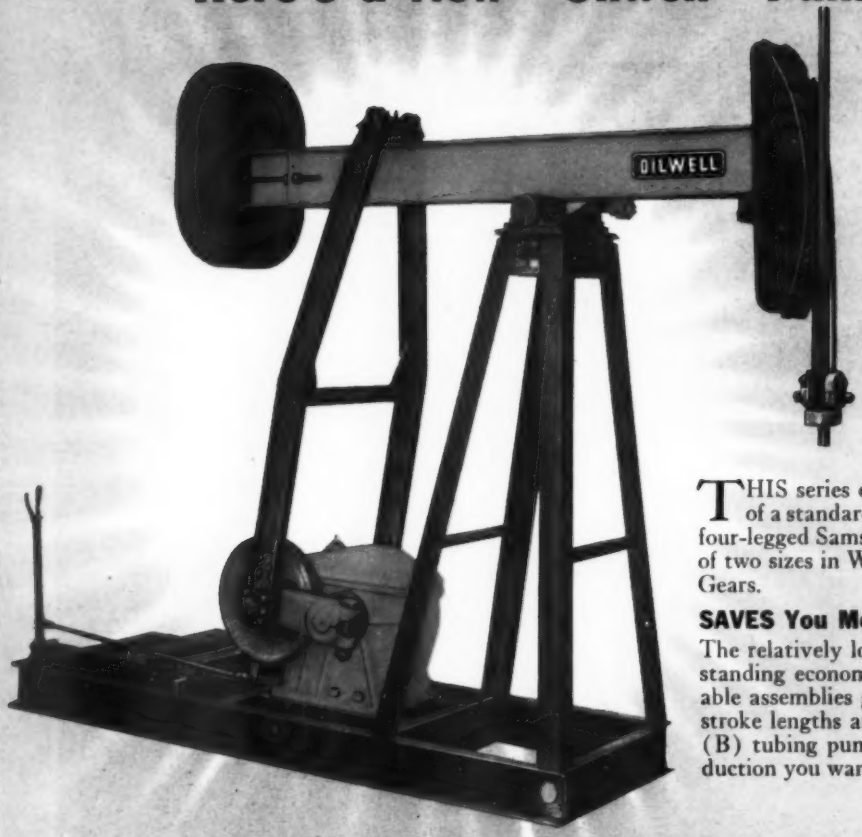
Takes your highest vacuum — B. F. Goodrich mud pump hose will take the highest vacuum pressures used in mud pump work. Heavy spring steel wire spiral-wrapped and imbedded in rubber prevents collapse, keeps rig drilling without costly repairs.

Cords cushioned in rubber — This hose is reinforced with four to six plies of cord — held together and cushioned by rubber that surrounds each individual cord. No cross threads. Hose is more flexible, yet stronger to resist crushing and kinking, help dampen vibration.

To see how B. F. Goodrich mud pump hose would improve your mud-line operation, call your local BFG distributor — who can also show you how you can get more service from B. F. Goodrich rotary drilling hose, vibrator hose, butane-propane hose, hydraulic control hose, V-belts. If you don't know your local distributor for these BFG oil field products, write *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Oil Field Products BY
B.F. Goodrich

Here's a New "Oilwell" Pumping Unit



for SHALLOW WELLS

THIS series of shallow-well Pumping Units consists of a standard structural steel Base with wide-spread, four-legged Samson Post . . . designed for use with either of two sizes in Walking Beams, Pitmans and Reduction Gears.

SAVES You Money — TWO WAYS!

The relatively low cost of this series of units is an outstanding economy factor. In addition, its interchangeable assemblies give you the exact combination of (A) stroke lengths and horsepower input needed to go with (B) tubing pump and sucker rod sizes to get the production you want at the lowest possible cost.

It gives you your choice of:

4 Different pumping-capacity ranges

	Unit Designation	Reduction Gear Peak Torque Rating	Polished Rod Load Capacity—lbs.	Stroke Length Range—Inches	Strokes Per Minute	Prime Mover Input—H.P.
1	3-A-3	16,000	3,225	22½, 25-3/4, 30	20	3
2	5-A-3	24,100	3,225	22½, 25-3/4, 30	20	5
3	3-A-4	16,000	4,025	18, 20-5/8, 24	20	3
4	5-A-4	24,100	4,025	18, 20-5/8, 24	20	5

Consult an "Oilwell" Field Engineer on ALL your Production Problems

The more you know about "Oilwell" Production Equipment . . . the better you'll like it. Educational Motion Pictures are available without charge for showings before your production personnel: Ask to see:

"'Oilwell' Pumps for Oil Wells"
"Sucker Rods . . . from Mine to Well"
"GEARS . . . and OIL"

This New Series of Units

. . . is built with the same field-proven design features that have made larger "Oilwell" Units so popular with producers. Their inherent stability, ample strength and accurate counterbalancing permit safe operations over a wide speed range. Their outstanding features include:

1. Wide-spread four-legged Samson Post.
2. Ample stuffing box clearance.
3. Walking Beam adjustment permitting exact positioning over well.
4. Grease lubricated Saddle Bearings, Upper Pitman Bearings and Wrist Pin Bearings.
5. Spherical Roller Wrist Pin Bearings in Solid Housings.
6. Double Reduction, fully heat-treated, single-helical Gears and Pinions in heavy-duty, adjustable Tapered-Roller Bearings.
7. Band-type Brake with Remote Control.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

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Export Division Office —
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USS "OILWELL" TRADE MARK

UNITED STATES STEEL

Judge it by the jobs it handles

TIGER BRAND WIRE ROPE

SOME of the world's deepest wells have been drilled with TIGER BRAND Wire Lines . . . and some of the fastest drilling records have been set with rigs strung with TIGER BRAND. These outstanding jobs prove the outstanding performance of TIGER BRAND Rotary Lines.

But there's one record that may be of more interest to you than any of these—and that's the day-by-day record of "low cost per ton mile" on your own rig. We have seen enough performance records to know that TIGER BRAND Lines, when properly handled, will give you the most service for dollar of cost.

There's a reason for this. Through constant research on the strength of various steels, wearing qualities, flexibility, construction and lubrication, our engineers have determined the best combination of properties for any particular job. When you use TIGER BRAND Wire Lines, you automatically get the benefit of this research and experience.

TIGER BRAND 1¼" ROTARY DRILLING LINE on a well near Cordell, Oklahoma. This contractor keeps an accurate record of wire rope life and uses a high percentage of Tiger Brand.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN TIGER BRAND WIRE LINES

USS *Excellay Preformed*

SEND FOR FREE BOOKLET

American Steel & Wire Company
Rockefeller Building, Dept. P-6
Cleveland 13, Ohio

Gentlemen:

Please send me a copy of your booklet, "U-S-S American TIGER BRAND Wire Lines For Oil, Gas and Water Wells."

Name.....

Company.....

Position.....

Address.....

UNITED STATES STEEL

XUM

KEEP IT HANDY!
You Know You Have Good
HOLE INSURANCE
With this American Iron Releasing & Circulating Overshot on your derrick floor!
That's right! When you keep this all-purpose fishing tool and its accessories in readiness on your derrick floor, you're prepared for any fishing job . . . ready when it needs to be done. That's why we say it's good "hole insurance"! It eliminates costly delays by making it possible for you to get a fishing job under way and completed in double-quick time. Then you're back to making hole—and making money!
American Iron Overshots are ruggedly constructed; simple in design; have quick positive releasing action. (See Composite Catalog pages 234-36). And you can always get slips and packer rubbers at your nearest supply store!
AMERICAN IRON & MACHINE WORKS CO.
OKLAHOMA CITY U.S.A.
Available Thru Your Supply Store
AMERICAN IRON & MACHINE WORKS CO.
OKLAHOMA CITY, OKLAHOMA — BOX 1177 — PHONE L. D. 518
District Office: Houston, Texas
Export Office: 11 West 42nd, New York City

NEW VALVES FOR LP-GAS NOW IN THE CRANE LINE

DESIGNED FOR TIGHT SEATING AND SIMPLIFIED DISC RENEWAL

These new Crane globe, angle, and lift check valves more than meet Underwriters' specifications for efficient handling of Liquefied-Petroleum Gases. Made of finest quality Crane Special Brass, these valves—with renewable composition discs—are constructed to withstand severe operating strains . . . can be dismantled and reassembled repeatedly without affecting efficiency. The features below show how these valves meet LP-Gas requirements.

TIGHT SEATING—all valves are equipped with a Crane No. 6 composition disc cemented tightly into disc holder as an added precaution against leakage.

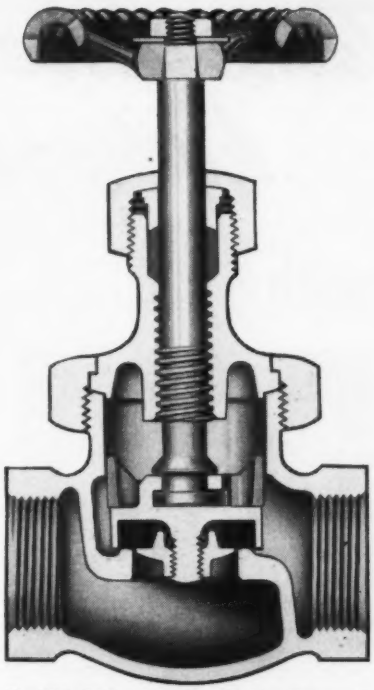
DURABLE COMPOSITION DISC—made of synthetic materials highly resistant to effects of petroleum products. Soft enough for tight seating, yet plenty stiff and resilient to withstand hard and repeated usage.

EXTRA-TIGHT STEM SEAL—stuffing box is of liberal capacity and is filled with Crane one-piece molded asbestos packing especially selected for LP-Gas services.

SUITABLE FOR OTHER SERVICES—although these valves were designed for safer handling of LP-Gases, they are highly recommended for hot or cold water, compressed air, gasoline and light oils at pressures and temperatures not exceeding valve ratings.

For further information, see your Crane Representative or write for FOLDER AD-1820.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

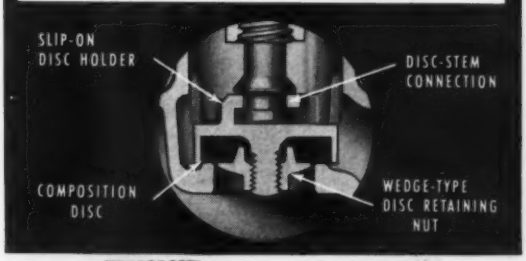


No. 130, Globe, Screwed. Working Pressures: 400 pounds gas or oil; 150° F. Max. Temp. 400 pounds water; 200° F. Max. Temp. Sizes: ¼ to 2-inch

HOW CRANE DESIGN ADDS TO DISC LIFE...SPEEDS DISC CHANGES

New wedge-type disc-retaining nut reinforces composition disc against strains and distortion caused by tight valve closure. This feature adds materially to disc life.

Composition disc can be renewed without removing valve from line. Merely open the union ring bonnet joint—or cap joint on check valves—and lift out complete disc assembly. Replace the disc holder with a spare containing a new disc. Reassemble the valve.

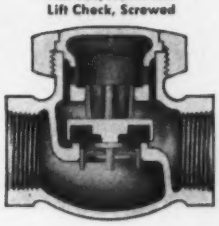


EVERYTHING FOR EVERY PIPING SYSTEM

CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

No. 131, Angle, Screwed



No. 132, Horizontal Lift Check, Screwed

Tame those touchy hydrocarbons

with a BJ Stuffingboxless Pump

Engineered for safe, simple, economical handling of butane, propane, ethane and other volatile hydrocarbons . . .

CAN'T ESCAPE

Leakage of pumped fluid to atmosphere is impossible. The motor and close-coupled pump are totally enclosed in a sealed pressure vessel. There's no fire hazard or danger to property or personnel caused by leakage.

ABLE TO CONTAIN HIGH PRESSURES

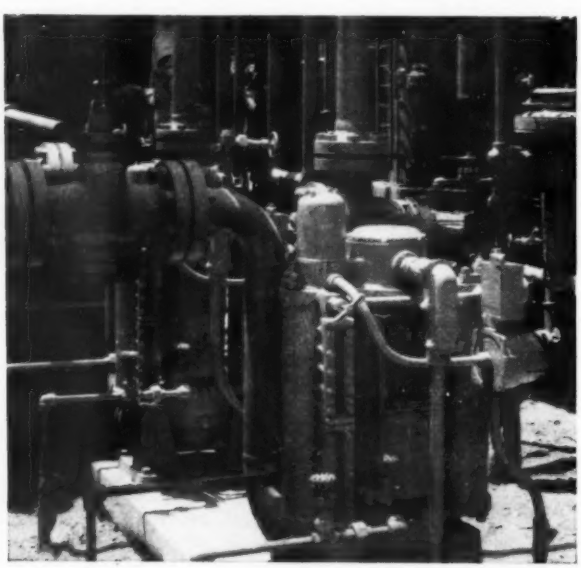
BJ's pressuring system maintains a predetermined pressure across the mechanical seal that separates the motor from the pump within the chamber. This pressure is constant, regardless of suction and discharge pressures.

NO "KEEPER" NEEDED

No special attendant is needed to guard against leakage and consequently no costly maintenance time is spent in repacking and adjusting.

OPERATING SAVINGS

While the first cost of the BJ Stuffingboxless Pump is somewhat higher, big and continuing savings are offered in operation. There's no product loss through leakage, no downtime due to flood-out.



THE *RIGHT* PUMP FOR YOUR JOB

The BJ Stuffingboxless Pump is available in a wide range of models and pressuring system combinations to meet individual requirements. Byron Jackson Co. engineers are ready to help you secure the BJ Stuffingboxless Pump best suited to your job. Write, wire or phone today.

Byron Jackson Co.

Since 1872

P. O. Box 2017 Terminal Annex, Los Angeles 54, Calif.

OFFICES IN PRINCIPAL CITIES

THESE BJ STUFFINGBOXLESS PUMPS handle ethane in a de-ethanizing operation. Pumping temperature is 80° F; suction pressure 490 psig; discharge pressure 520 psig; capacity 100 gpm; speed 3550 rpm; total head 165'; and specific gravity 0.42.

2 more

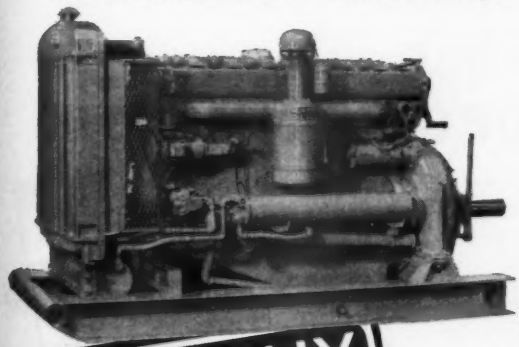
MURPHY DIESELS

for Hilton Drilling Co.
Great Bend, Kansas

WHEN it comes to buying engines, drillers base their decisions on their own and others' past experience. That's why we say the Murphys we've already sold are our best salesmen. Good examples are the two Murphy Diesels shown in the photo at the right. These were purchased in 1946 by the drilling department of the Crown Oil Company (now operating as the Hilton Drilling Co., Great Bend, Kansas). The service these engines have given and are giving sold Hilton on selecting another Murphy powered rig in 1949.

Why don't you profit by the experience of other drillers and give Murphy Diesels the opportunity to sell themselves to you. See your Murphy Diesel Dealer or write direct.

MURPHY DIESEL COMPANY
5305 West Burnham St. • Milwaukee 14, Wis.

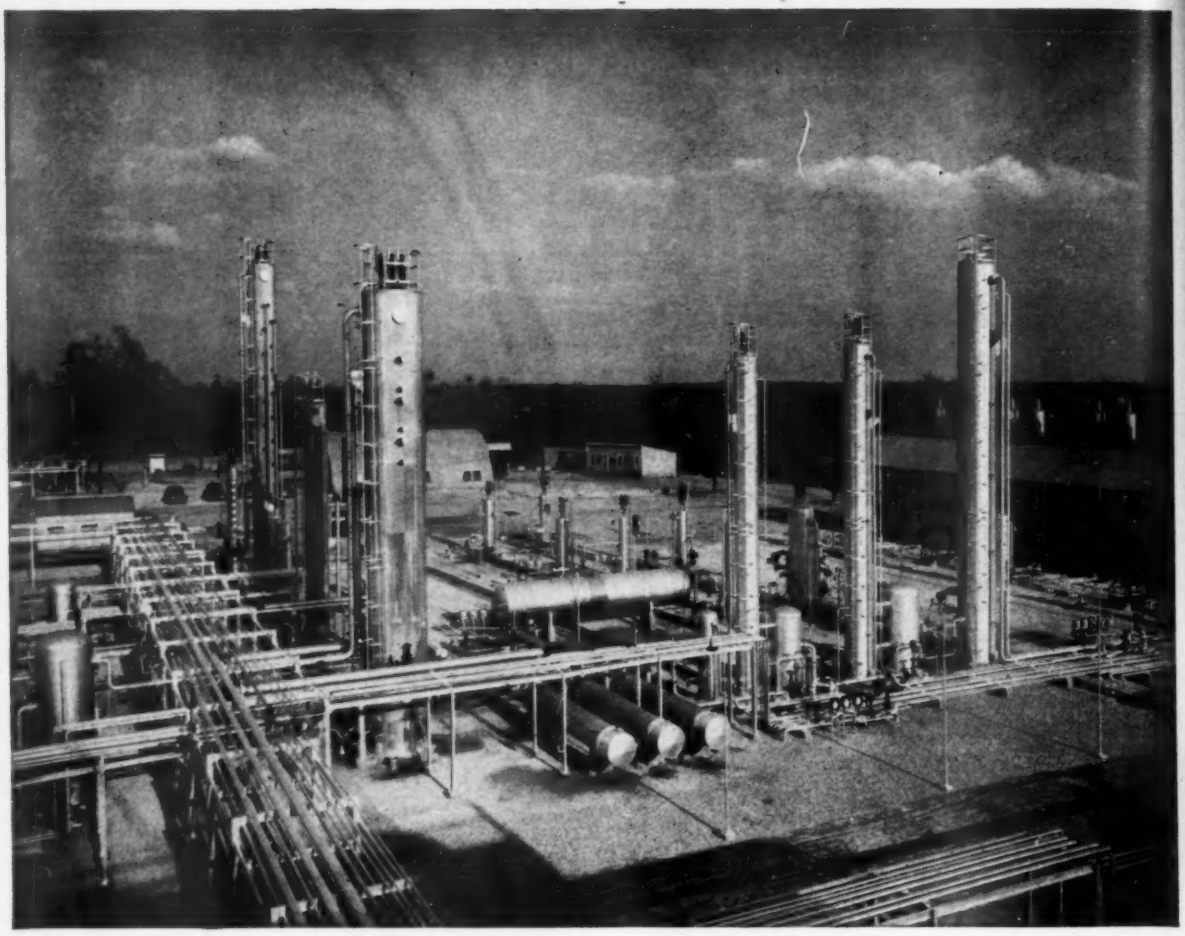


MURPHY DIESEL

Heavy duty power
for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 220 H.P. Generator Sets 60 to 133 K.W.

XUM



The Petroleum Industry Relies on Famous PITTSBURGH FINISHES!

RUGGED, long-lasting and resistant to corrosion and weather—there's nothing else like Pittsburgh Finishes.

Pittsburgh's intensive research, plus laboratory control of raw materials and finished products, is your assurance that these coatings give you all you want in toughness, long life and low-cost protection.

Characteristic of these high-quality finishes are Pittsburgh's Aluminum Paints and Paint Liquids. For many years the petroleum industry has recognized their durability and heat and light reflection.

Pittsburgh's Aluminum Paints offer the convenience of paints ready for use without any mixing of pigment and vehicle. They have excellent hiding and the vehicle is especially formulated to retain the brilliance of leafing of the aluminum pigment upon aging.

Pittsburgh's Aluminum Vehicle is also furnished for those who wish the vehicle and pigment on the job. In addition, Pittsburgh makes available a complete line of finishes for every need in the petroleum industry, including Tankhide and Ironhide. Our wide experience in this field may be helpful to you—and save you time and money. Call on us for advisory service.

We'll be glad to send you a copy of our new booklet on Pittsburgh's Aluminum Paints and Paint Liquids upon request and without obligation. • • •

PITTSBURGH PLATE GLASS COMPANY

Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Tex.; Los Angeles, California; Portland, Oregon. Ditzler Color Division, Detroit, Michigan. The Thresher Paint & Varnish Company, Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

PITTSBURGH *Industrial* **FINISHES**

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

They all Point to

SUPPLY BOVAIRD COMPANY

COMPLETE STOCKS

STRATEGICALLY LOCATED STORES

QUALIFIED PERSONNEL

FRIENDLY SERVICE

Bovaird stores, strategically located throughout Illinois, Kansas, Oklahoma and Texas, maintain complete stocks of the finest oil field equipment available.

The qualified personnel in every Bovaird store will give you efficient, dependable, friendly service any time you "Buy From Bovaird."

OFFICES AND STORES

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TEXAS—Borger, Dallas, Odessa, Pampa, Snyder

"Buy From Bovaird"

THE Bovaird SUPPLY CO.

GENERAL OFFICES

TULSA, OKLAHOMA

KEEPING MUD ON THE MOVE TO YOU

MAGCOBAR MAINTAINS STOCKPILES OF DRILLING MUD MATERIALS RIGHT AT YOUR RIG'S BACK DOOR

In many cases, the mud weighting materials and chemicals oil operators use to transform emergencies into routine operations would be of no value if they were more than an hour away from the drilling location.

Magcobar has successfully met this challenge for efficient service by establishing a network of more than 250 dealers from Canada to the Gulf Coast. Each of these friendly Magcobar dealers maintains a stockpile of mud weighting materials and chemicals, more often than not right at your rig's back door! This on-the-spot-service . . . representing an investment of hundreds of thousands of dollars by Magcobar . . . pays off by saving operators millions of dollars a year in rig time and by preventing troubles that might be caused by delays in mud or chemical deliveries.

The next time you need mud, look for the dealer who stocks Magcobar. He is doing his dead level best, night and day, to keep mud on the move to you! You can depend on him to handle your mud requirements promptly and at fair and reasonable prices.

MAGNET COVE BARIUM CORPORATION
MALVERN, ARKANSAS HOUSTON, TEXAS

Export:
Daniels, Beckley and Associates
30 Rockefeller Plaza New York, N. Y.

LOOK FOR THIS SIGN WHEN YOU NEED MUD

MAGCOBAR ● MAGCOGEL ● HIGH YIELD DRILLING MUD ● XACT CLAY ● FIBER-SEAL ● MAGCO-MICA ● TANNATHIN ● JEL-OIL MUD ● JEL-OIL "E" ● SALT GEL ● NOHEEV ● SEAL FLAKES ● MY-LO-JEL ● CHEMICALS

Magcobar
Complete
DRILLING MUD SERVICE
DEALER

WHEN YOU WANT

BOTH Precision and Economy

Specify CHAPMAN STEEL VALVES

Want valves with precision ratings that equal or exceed standard specifications? Then specify Chapman Valves. You'll find them the equal of custom-made valves *every time.* Yet they are economical — with the economy that comes from production line manufacture.

You'll find it will pay to specify Chapman Valves for every need — for longer service, for better service, for lower maintenance.

Available in gate, globe, angle or check types, and in materials suitable for every service condition.

Standard type Steel Gate Valve available in materials as specified.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASS.

XUM

Change Now to S/V Sovabead

The sooner you get these hard-working beads in your dehydrator, the sooner you'll get greater efficiency . . .

This new Sovabead team is ready now to give you all the benefits of a vastly improved desiccant for natural gas dehydrators.

Why wait until your present drying agent is completely inactive before you change?

Here's what you can get immediately:

S/V Sovabead increases the capacity of your units (almost double). It maintains this capacity at high temperatures (as high as 120° F.) with low effluent dew point.

S/V Sovabead dries sour gas, with a longer bed life. It eliminates caking and reduces channeling, dusting and pressure drops in the bed.

Reactivation is quick, easy, and economical.

Get the facts today from your Socony-Vacuum Representative.

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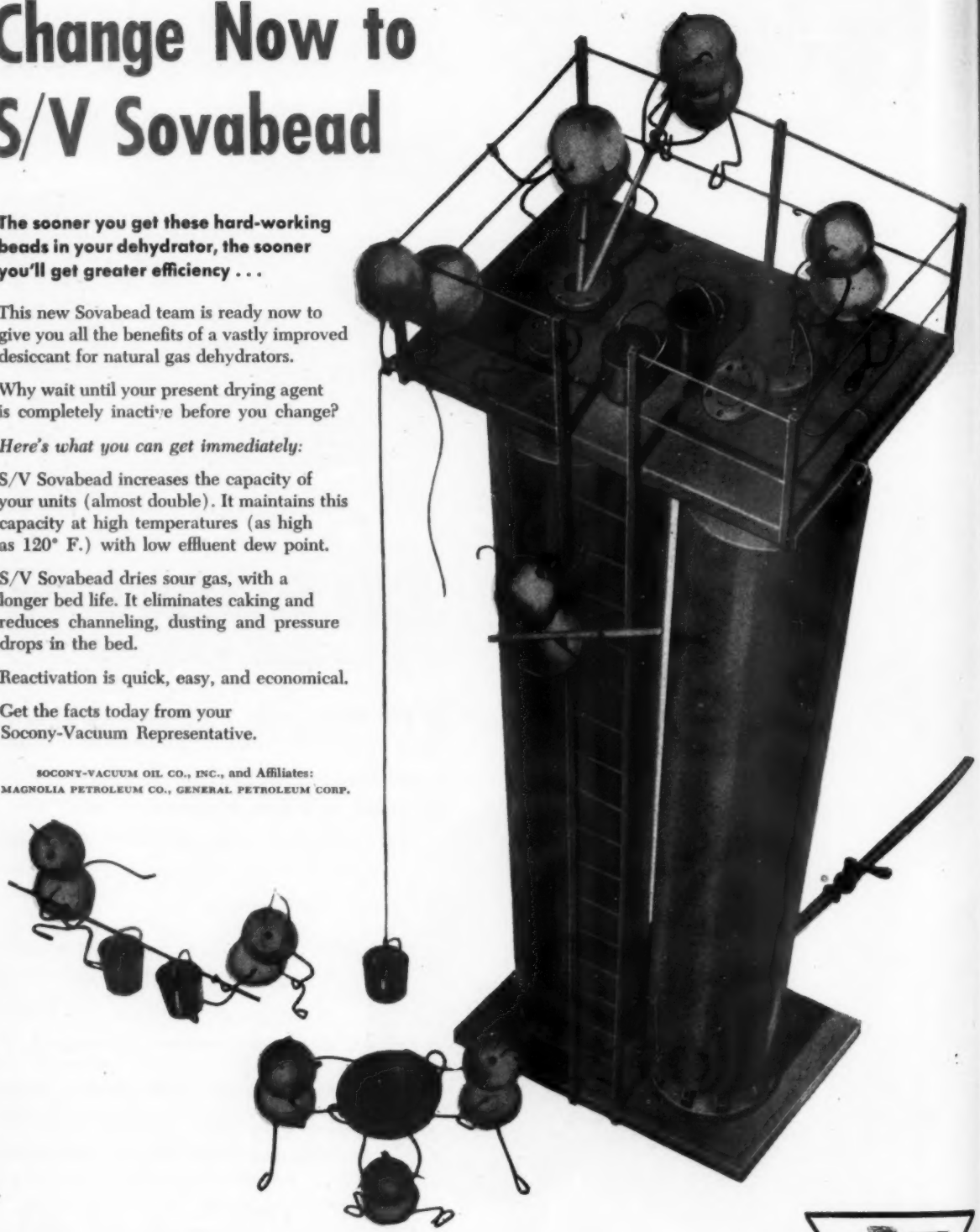

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K&M *"Century"* ASBESTOS CORRUGATED WALLS

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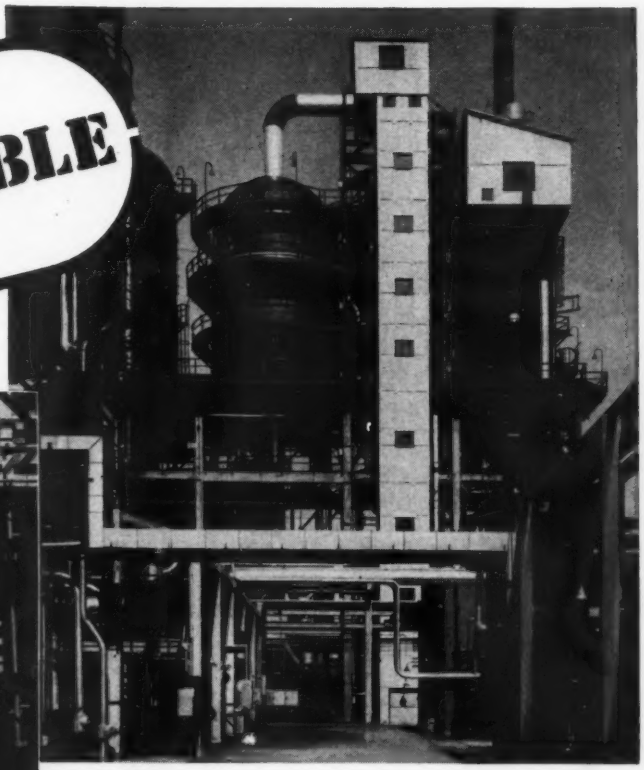

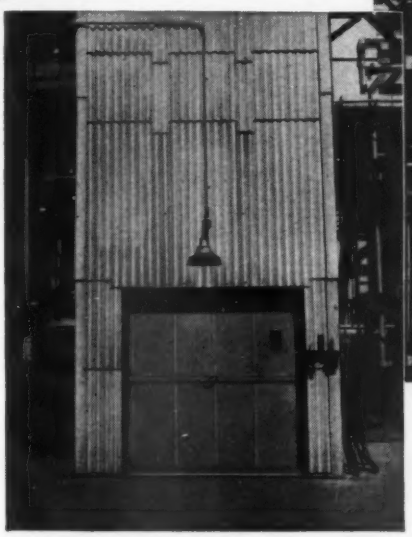

Mid-Continent Petroleum Corporation Refinery, West Tulsa, Oklahoma.

Elevator Tower and Penthouse protected by K&M "Century" Asbestos Corrugated, applied with "TOP-SIDE"* Fasteners.

Industrial and commercial building walls need a rugged constitution. That's exactly why K&M "Century" Asbestos Corrugated walls are bound to be an economy for you. They provide all the structural strength and staying power of the proved K&M Asbestos-Cement combination. They shed extremes of weather and other atmospheric threats, without even needing paint. They defy fire, rust, rot, rodents and termites. You can plainly add it all up to long-term freedom from maintenance.

Initial savings are just as plain, for K&M "Century" Asbestos Corrugated goes up fast, no special work needed. Fitting is easy with ordinary cutting and drilling tools. Even scaffolds and extra labor can be eliminated by using "TOP-SIDE"* fasteners. They're made so that K&M Corrugated can be anchored to steel members of any type, on sides or roofs. You'll have protective enclosure—and cost figures—that keep on looking good.

Write for the name of your nearest K&M Distributor, and full data on K&M "Century" Asbestos Corrugated.

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LAYNE

WELL WATER SYSTEMS

VERTICAL TURBINE PUMPS

They Say—

From the Tipro Reporter, Texas Independent Producers and Royalty Owners Association.

Need for New Law

"While all of us who have had any connection with the (California) conservation organization deny that it has created monopoly, as the Government charges, nevertheless the federal attack demonstrates that voluntary efforts cannot be relied upon to fully accomplish the desired conservation. . . .

"With the filing of a suit by the federal Government which seeks to dissolve the committee and prevent the establishment of other voluntary conservation practices not authorized by state law, the voluntary program is bound to be even more important. This action by the Government is just one more reason for a state conservation law."

L. A. Cranson, president, Oil Producers Agency of California, addressing an American Association of Oilwell Drilling Contractors dinner meeting, Los Angeles.

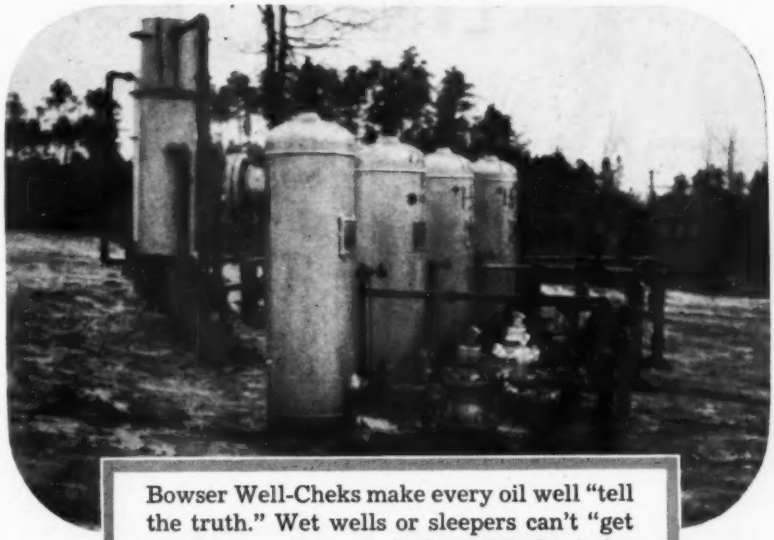
Change for Coal

"The present-day prairie-fire type of expansion in natural-gas pipe lines and natural-gas use over the country is setting the stage for a great high-B.t.u. - gas - from - coal industry for which the country is not technologically prepared.

"For natural-gas use, facilities are being installed and/or adjusted to high-B.t.u. gas (1,000) the country over. . . . Responsible thinking can only see generally rising prices for natural gas in the field and at the consumer level; and, sooner or later, difficulties and then decline in supply. This could be soon in a national emergency.

"Other results of the large expansion of natural-gas usage are easily visualized. . . . These include crippling the economy of the coal industry, loss of coal-production capacity,

"Lie Detectors" for OIL WELLS



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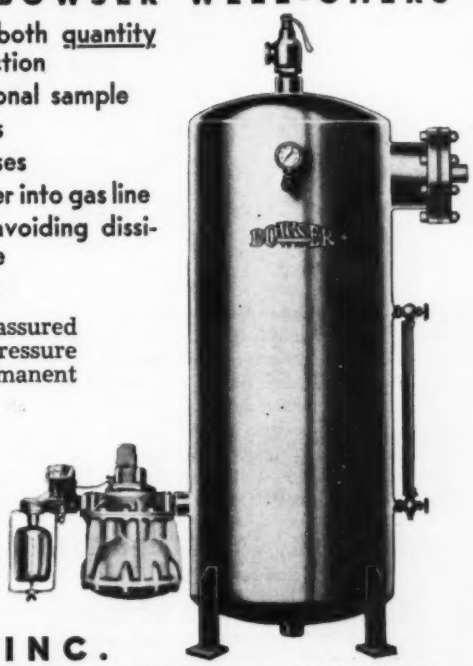
- Accurately indicate both quantity and quality of production
- Furnish true proportional sample
- Eliminate gauge tanks
- Stop evaporation losses
- Prevent crude spill-over into gas line
- Conserve crude by avoiding dissipation of well pressure
- Minimum fire hazards



Dependable operation is assured on flowing wells, pump pressure or vacuum—either as permanent or mobile units.

There's a Bowser meter engineer near you who will be glad to check your wells and suggest a plan which may lower production costs. Just write to . . . . .

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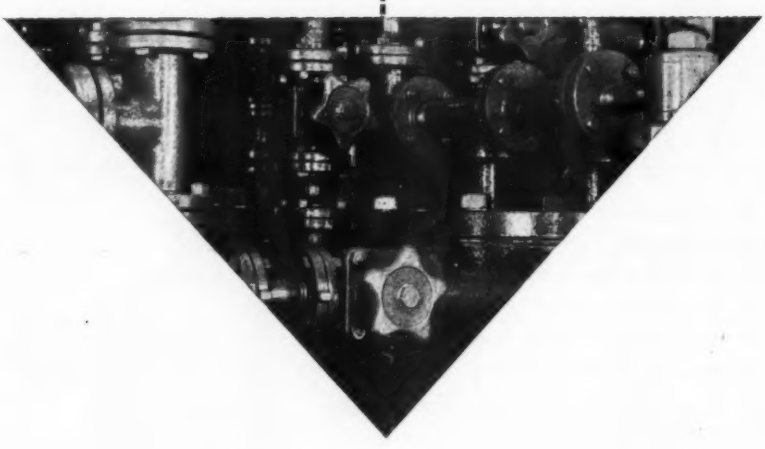
means dependable protection

against corrosion!



For the dependable protection against corrosion that assures you of long-term operation at a minimum maintenance cost—*specify saran lined steel pipe.* Saran's unusual resistance to most chemicals and solvents plays an important part in the reduction of shutdowns and lost production. Another noteworthy advantage is its ease of field fabrication—involving NO costly delays with special tools or handling. Saran lined steel pipe is available in maximum lengths of 10 feet and in sizes from 1 to 6 inches. Also available are saran lined diaphragm valves, plug valves, flanges, reducing flanges, flanged fittings, gaskets and fittings with union ends. Manufactured by The Dow Chemical Company, Bay City, Michigan, distributed by Saran Lined Pipe Company, Dept. TSP-31.

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product

loss of coking capacity in the merchant coke plants, and loss of stand-by gas-making capacity in the present-day manufactured-gas industry.

"The . . . considerations point most clearly to the necessity for this country to prepare technologically for economical large-scale conversion of coal to high-B.t.u. gas. We dare not wait for the natural-gas supply to decline to seek the substitute—high-B.t.u. gas from coal. It will take 5 to 10 years to do the necessary research and development work.

"The situation calls technologically for the development of basic data on essentially three major items, namely (a) the conversion of coal to water gas, (b) the conversion of water gas to high-B.t.u. gas—a catalytic methanization step, and (c) authoritative gas-production cost data for these processes, based on operation of pilot plants of the better methods studied or developed."

Ralph L. Brown, Bureau of Mines, in a paper presented before the Production and Chemical Conference, New York.

Antitrust Confusion

"The truth is that we have on our federal statute books today a complete hodge-podge of so-called 'anti-trust' laws which have been allowed to grow, like Topsy, for 60 years, and which cannot be reconciled even with each other. And the only way a businessman can be sure of obeying them all is just to go broke."

Benjamin Fairless, president, United States Steel Corp., speaking in Boston.

Answering the Alarmists

"The joint American Petroleum Institute-American Gas Association report of oil and gas reserves . . . shows our nation's reserves at an all-time high.

"For more than 25 years our proved reserves have stood at approximately 13 years' demand. If there is need for a greater supply the oil and gas industry will find it. It seems safe to predict that we will be burning liquid fuels from natural sources in 2050, with about the same concern for reserves as expressed today."

Dr. Roland F. Beers, Rensselaer Polytechnic Institute, in a letter to the New York Times.

Mislabeled Table

Sir:

I have noted the publication of our article, "Use of Periodicals in Petroleum Research," in The Oil and Gas Journal (May 18, page 121), and appreciate the way in which it was handled.

Proofreading of our final copy failed to catch an error in the headings of two of the columns in Table

WHELAND *Swivels* keep drilling costs down

Available in 4 sizes—

E-6100 to 5,000′;
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4 ways—1. BETTER Materials—long life. Manganese vanadium main body has high strength; is shock resistant. Wash pipe is hardened steel. Bearings protected by generous safety factor.

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3. NO Adjustments — less maintenance. Outside of servicing the Alemites and checking oil levels now and then, there are no maintenance chores on a Wheland Swivel. Saves time, prevents trouble due to neglect.

4. PARTS & Service—always nearby. Each of Jones & Laughlin Supply's 79 stores is interested in helping you get the most in performance and economy from Wheland equipment — swivels, pumps, blocks and drawworks. Each is as near as your 'phone. Use it.

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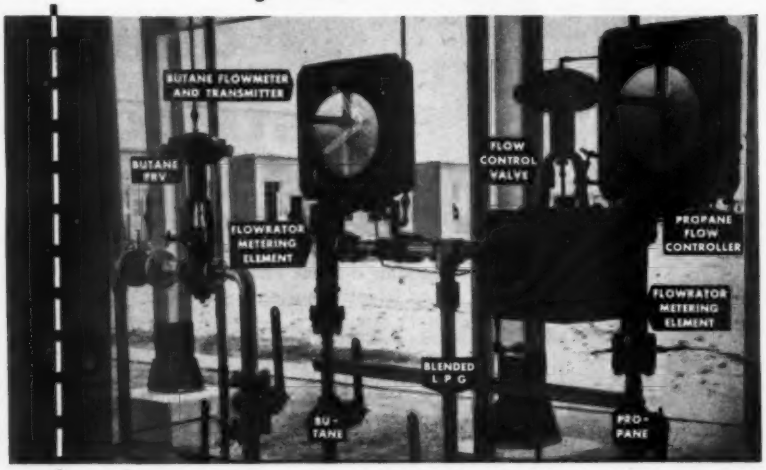
through simplified

straight-line accuracy

flow control



The F & P RATIO CONTROLLER blends overhead products from depropanizer and debutanizer columns to exact vapor pressure specifications. It's no longer necessary to change tower operation when vapor pressure specs are altered; you simply turn a knob in the RATIO CONTROLLER to get any blend ratio between 90% C3 - 10% C4 and 10% C3 - 90% C4.

The flow of butane is accurately measured by a FLOWRATOR meter-transmitter. This resets the control point on a similar FLOWRATOR instrument which controls the amount of propane put into the LPG mixture.

Here are a few of the "plus" features of the F & P RATIO CONTROLLER:

1) They record butane and propane flows; valuable operating records are produced without additional flowmeters. 2) Their flow scales are uniformly spaced; peak accuracy is assured over the entire range of flow measurement. 3) They are free of electrical connections; safe in hazardous areas. 4) They require no "meter runs"; installation cost are low. 5) There is just one moving part, free of packing glands; maintenance costs are negligible.

For detailed engineering information write for Bulletin 53.

FISCHER & PORTER CO.
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FLOWRATOR

INSTRUMENTS FOR FLOW MEASUREMENT AND AUTOMATIC CONTROL

3. The heading for Column 2 should be "Percent of References" and of Column 3, "Cumulative Percentage." I am sorry that this error was not caught here since it may cause readers some confusion.

I should also have indicated Miss Hardie's location as Carnegie Library School with present address Carnegie Library of Pittsburgh. Also the fact that the material for this paper was based on a master's problem at Carnegie Library School.

Of course, it is too late to make any corrections in the article, but I am sending the above information to at least clear the records.

M. J. Voigt, librarian
Carnegie Institute of Technology, Pittsburgh.

Kentucky Conservation

"Few, if any, oil wells are produced beyond the MER, and it can be said to the credit of the operators that little or no oil is wasted by the overproduction of wells. Most of our wells pass into the stripper class after a short period of flush production.

"It must be admitted, however, that if pressure-maintenance programs were put in operation in the early development stages of our oil pools, the ultimate production would be greater. Such procedure would mean that primary production would be one continuous operation, making it unnecessary to instigate costly repressuring operations at a point when the production might be at a stage where it would be a questionable matter whether the additional cost required to produce more oil would be warranted."

Earle C. Clements, governor of Kentucky, writing in "Saving Your Oil," published by the Interstate Oil Compact Commission.

Weakened Incentives

"Many factors are today tending to weaken the incentives which have made America what it is.

"1. The impersonal character of our great cities reduces the incentive of the approbation of our fellow man.

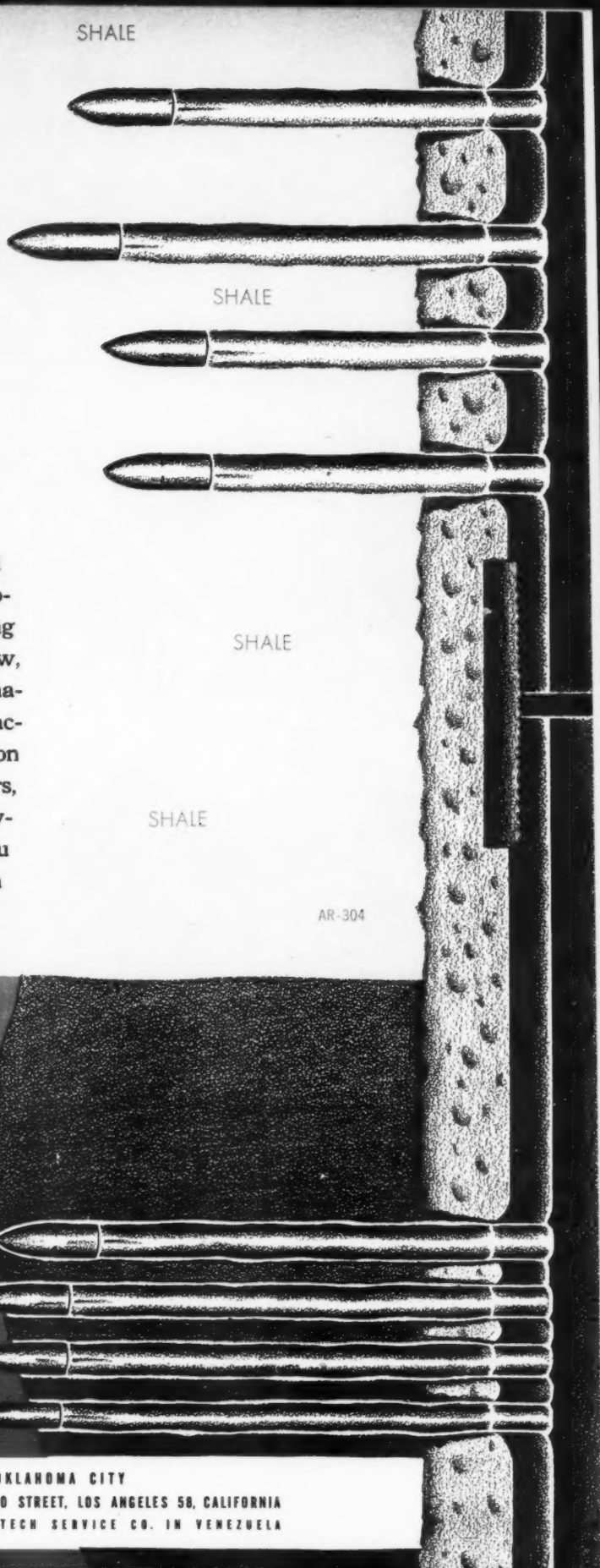
"2. High taxes, double taxation on dividends, and low interest rates reduce the incentives to save and to invest in the tools which made possible our high productivity.

"3. Heavy personal taxes, political attacks on successful businesses and business men, reduce their incentives to work hard, achieve, and expand.

"4. Union insistence on seniority rather than ability as the basis for promotion weakens incentives for the rank and file."

Dr. Robert E. Wilson, board chairman, Standard Oil Co. (Ind.), speaking at dedication of Hastings College Chapel, Hastings, Nebr.

YOU CAN PREVENT THIS—



Just do as most experienced operators do...run a Lane-Wells Radioactivity Well Log before completing the well. With this log you will know, accurately, the depths of all formations, their extent and their characteristics. And, since the information is tied directly to the casing collars, you have a whole series of immovable reference points which give you depth measurements accurate within inches . . . . for perforating, setting packers or any down-hole operations.

That's how...

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Radioactivity Well Logging

HELPS PUT THE PERFORATIONS IN THE PAY!

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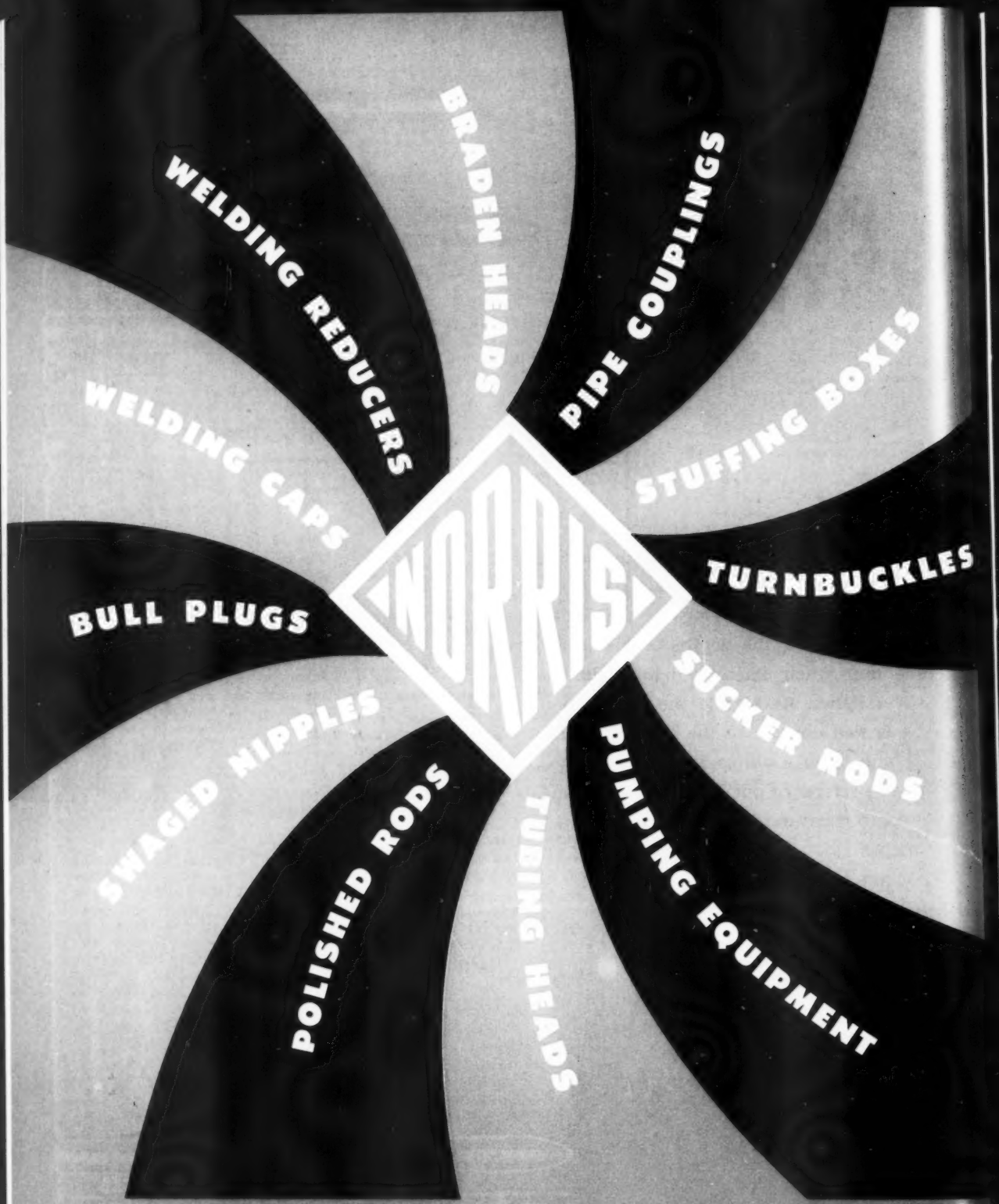

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Published every Thursday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Okla. Founded in 1902. Name changed to The Oil and Gas Journal in 1910 by Patrick C. Boyle.

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JOURNALLY Speaking

Cracker Fun

"DEAR SIR," writes a reader, "In the May 18 issue of your favorite magazine you have a little item headed Kitten Cracker. It refers to refinery engineers' use of exact 'polly-syllabic' terms. Was that due to association of ideas with 'cracker' or with 'cat'?"

Now, if he hadn't suggested an alibi it would have been downright mean of him to pick on us for letting that extra "l" slip in there. We catch plenty of "l" in this business anyway. Ordinarily we would blame a mistake like that on the proofreader, but since our critic is in a punning mood we will admit that the phrase "Polly wants a cracker" probably made us think that a cat cracker wanted a two-l polly. We don't want to be catty in our cracking.

And another reader writes in to remind us that a cat cracker is nothing like a dog biscuit. That ought to just about exhaust the possibilities of punning with this subject.

Tales of Araby

OUR travelingest editor, Paul Reed, is now somewhere amid the sands of Arabia, presumably taking notes and pictures of all petroleum activities between the Mediterranean and the Persian Gulf.

Paul went over to check up on how the boys are getting along laying the Tapline, and otherwise to report for our readers on the situation in the Moslem sphere of the world of oil. He is supposed to send back a series of matter-of-fact engineering articles on various technical phases of petroleum operations in the Middle East. But after his first letter we are beginning to fear that the spell of the East may have diverted Paul from his assignment. Here's a sample, written from Jedda, Saudi Arabia:

"You may recall that T. E. Lawrence spoke of Jedda as the white town hung between a blazing sky and its reflection in a mirage when the heat of Arabia came out like a blazing sword. Behind a pallid luster of haze the dazzle of a long stretch of featureless sand running up to the edge of low hills suggested more heat beyond. Black and white buildings move up and down like pistons in the mirage. There's no doubt about being in Arabia when you get here."

It looks as though Paul's classical Harvard education is cropping out despite years of association with prosaic and unpoetic pipe liners. We can picture Paul, wearing a burnoose, sitting under a striped awning somewhere east of Suez where the best is like the worst, with a jug of wine and a book of verse, contemplating the mysteries of the Orient and forgetting all about pipe lines and deadlines.

But not for long, we bet. Those buildings going up and down like pistons will probably make him long for the cool summers of Oklahoma, and we expect to see him and his articles in Tulsa before the sun reaches the Tropic of Cancer.

White Hope

A GERMAN scientist who claims he has a process for making motor fuel out of water says he will not sell his invention to any private concern but wants to interest some government in it. He might try our Interior Department, which is the official worrier over what to do when we run out of oil and which to date has failed to arouse 100 per cent enthusiasm for its gasoline-from-coal project.

Aromatic Error

A MANUFACTURER of printing inks is now offering magazine publishers inks with odors to suit their subject matter. There could be pine aroma for a hunting magazine, new-mown hay for a farm paper, lilac for a garden book, and bacon and coffee for a home-makers' sheet. We considered trying a strong petroleum fragrance for this page, but were afraid there might be complaints that it is smelly enough already.

—Henry D. Ralph

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We buy . . .

Petroleum Products. Our efficient marketing organization will assume the job of selling your surplus stocks. You'll profit, and it'll be a pleasure to deal with Anchor.

We sell . . .

Petroleum Products. Butane-Propane, Natural Gasoline, Diesel Oil, Fuel Oil, Kerosene, etc. Prompt attention to your orders and fast, efficient deliveries. Call Anchor First.

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2. You can choose the type of Baker Bridge Plug exactly suited to your particular job: the Cast Iron type for permanent installations; the Magnesium Alloy type for temporary installations.

3. Regardless of the size or type of Baker Bridge Plug used, you *know* that it will drill out quickly and easily, because *all* Baker Bridge Plugs are designed with "drillability" in mind. The very minimum cross-section of material need be drilled up, and even the slips are designed to break up readily.

4. You won't need to place cement above the Baker Bridge Plug to obtain a 100%, leak-proof pack-off; but you'll be able to place the cement there if you desire simply by using the special Baker Model "B" Dump Bailer, which is run on the wire line at the same time as the Bridge Plug.

5. You can select your favorite wire line service company to do the job—see list below.

**Now you can also run and set the Baker Model "D" Retainer Production Packer (Product No. 415-D) on a wire line. Ask your service company for details, or send today for a free copy of the new 84-page Baker Packer brochure.*

Baker Model "K" Wire Line Bridge Plug... a product of...

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For Wire Line Service Call . . . BYRON JACKSON—Service Division • DOWELL, INCORPORATED • INTERNATIONAL CEMENTERS, INC. • LANE-WELLS COMPANY • McCULLOUGH TOOL CO. • PERFORATING GUNS ATLAS CORP. • SCHLUMBERGER WELL SURVEYING CORP. SPARTAN TOOL AND SERVICE CO. • WELEX JET SERVICES, INC. • THE WESTERN COMPANY

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A Summer Job

This page in the corresponding weeks of 1949 and 1948 assured motorists that refiners and distributors would be able to supply the record-breaking gasoline demands for the summer seasons of those years.

The analyses of 1 and 2 years ago were in reply to inquiries—many from the oil industry—as to whether it would be safe, as regards motor-fuel availability, to take the usual vacation trips. There were threatened shortages because of the war's curtailment in petroleum operations.

Refiners, as we were confident they would, devised means of doing what appeared to be the impossible during the two summer periods. Every petroleum need of motorists and other gasoline users was taken care of along with the usual services.

At the start of another 90 days of maximum gasoline consumption, the matter of scarcity does not enter into the season's calculations. The operating gaps of the first 3 years of the postwar period, applying to all divisions of the oil business, have been closed.

That fact does not detract from the enormity of the task ahead for refiners and marketers. Over the next 3 months the domestic market will require a minimum of 120 million gallons of gasoline every 24 hours. This estimate is based on a 5 per cent gain over last summer and the increase so far this year has been substantially in excess of that figure.

Many will recall the large bulge in gasoline consumption during the summer of the last prewar year of 1941. This summer's consumption will be 40 per cent greater.

But comparisons based on volume only partially reflect what is taking place. To assure maximum performance in today's motor vehicles, now coming on the streets and highways in numbers exceeding any other period, motor-fuel quality is being stepped up steadily.

Outstanding is the increase in gasoline ratings. Today's premium fuels of 86 to 93 octane, and 80 and better for most regular grades, represent gains of 10 or more points over prewar. Much of the increase has come since the close of the war.

A current report says that it costs the industry $450,000,000 in new or improved facilities every time the octane rating is increased one number. Views as to costs will vary but all will agree that the required refinery expenditures of the past 4 years have dwarfed any previous peacetime period. The modern refinery is rapidly duplicating the facilities required in the wartime plants to produce aviation fuels.

So this industry's 1950 summer job is well defined. It consists in brief in supplying its most essential product—gasoline— to more customers than ever before with emphasis placed on new standards of quality. In scope it exceeds any other manufacturing and merchandising responsibility.

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THIS WEEK

TIDELANDS—Supreme Court rules against Texas and Louisiana in tidelands cases. . . . Says federal Government has paramount rights to offshore oil. . . . ¶Administration of Gulf of Mexico operations may remain in doubt for months pending drafting of decree. . . . Federal Government believed unable to act without legislation. . . .

IMPORTS—Imports of crude and products totaled 837,000 bbl. daily in April. . . . Down 42,000 bbl. daily from March but up 234,000 bbl. daily over April 1949. . . . ¶Two congressional committees continue investigation of oil imports. . . . Coal men say foreign residual fuel oil robs them of rightful East Coast markets. . . . California spokesman says imports hurt oil industry there though not entering West Coast ports. . . .

ACTIVITY—Crude production for week ended June 3 averaged 5,151,825 bbl. daily, an increase of 89,450 bbl. daily over previous week and 226,800 bbl. daily over same week last year. . . . ¶A total of 826 wells were completed during the week compared with 775 for same week in 1949. . . . Wildcat completions were the same as last year at 156 wells. . . . ¶Rotary rigs operating in United States on May 29 totaled 2,156, the high point for this year. . . .

TRENDS—Fuel stocks at the end of May were further below last year than at the beginning of the month. . . . For 4-week period ended May 27, only kerosine stocks increased more than in same period last year. . . . Additions to distillate stocks were 2,000,000 bbl. under last year. . . . Residual stocks failed to increase this year compared with a gain of 3,000,000 in same weeks of 1949. . . . Withdrawals from gasoline storage were up almost 1,500,000 bbl. . . .

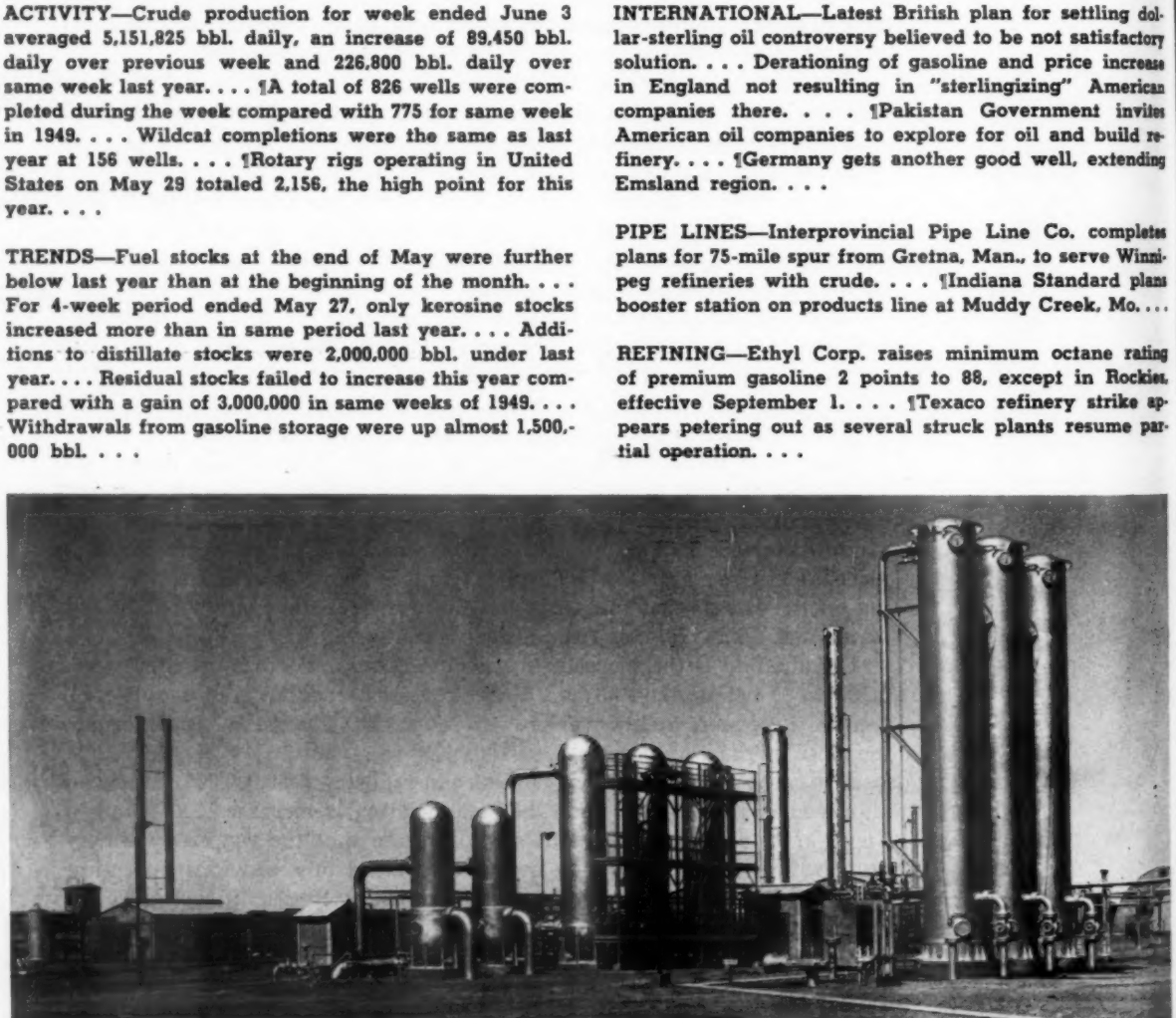
PRODUCTION—Diversity of producing operations illustrated by two fields currently holding much attention, one very deep, the other very shallow. . . . Plainville in Indiana illustrates cooperative development of town-lot field with low costs and quick payouts. . . . Pegasus in West Texas has drilling costs of $300,000 per well, nine possible pay zones, deepest production in region. . . .

WASHINGTON—Congress sends White House bill to clarify basing-point pricing practices. . . . May have important effects on gasoline marketing. . . . ¶Supreme Court fails to agree on Indiana Standard case involving reduced gasoline prices to meet competition in good faith. . . . ¶New lobbying investigation aims at all Washington activities of big oil companies. . . .

INTERNATIONAL—Latest British plan for settling dollar-sterling oil controversy believed to be not satisfactory solution. . . . Derationing of gasoline and price increase in England not resulting in "sterlingizing" American companies there. . . . ¶Pakistan Government invites American oil companies to explore for oil and build refinery. . . . ¶Germany gets another good well, extending Emsland region. . . .

PIPE LINES—Interprovincial Pipe Line Co. completes plans for 75-mile spur from Gretna, Man., to serve Winnipeg refineries with crude. . . . ¶Indiana Standard plans booster station on products line at Muddy Creek, Mo. . . .

REFINING—Ethyl Corp. raises minimum octane rating of premium gasoline 2 points to 88, except in Rockies, effective September 1. . . . ¶Texaco refinery strike appears petering out as several struck plants resume partial operation. . . .



GASOLINE FROM HUGOTON.—This natural-gasoline and gas-dehydration plant of Colorado Interstate Gas Co. at Lakin, Kans., processes natural gas from the Hugoton field, operating in conjunction with an adjacent gas-compressor station which serves the company's 20-in. line from the field to Denver. Boiler house for gasoline plant is shown at left. In center are scrubbers and dehydrators. The gasoline plant's still, stabilizer, and absorbers are at right. Colorado Interstate is seeking Federal Power Commission authority to acquire facilities of Canadian River Gas Co. and to build a 215-mile gas pipe line from the Texas Panhandle to Colorado, to meet increasing demands. Colorado Interstate now buys gas from Canadian River for resale in Colorado and Wyoming.

Tidelands Decision

Supreme Court follows California case, rules Government has paramount rights off both Louisiana and Texas coasts

Bertram F. Linz

WASHINGTON. — Oil-bearing tidelands lying off the coasts of Texas and Louisiana are subject to the paramount rights of the federal Government, the Supreme Court of the United States decided in two opinions handed down June 5.

The court thus, for all practical purposes, extended to the entire United States coast line the doctrine laid down in the case of California in 1947 that considerations of national sovereignty require the federal Government to exercise control over the marginal sea and its oil deposits from the low-tide mark to the international limit or the edge of the Continental Shelf.

The vote.—In the Louisiana case the court handed down a six-to-nothing ruling, but had more difficulty in reaching an agreement on the Texas case and rendered a four-to-two opinion.

Justices Jackson and Clark took no part in either case because each had been Attorney General of the United States while the cases were pending. Justice Frankfurter, who disagreed with the court's opinion in the California case, made separate comment which was construed as neither agreement nor dissent with the Texas and Louisiana decisions.

Delivering the court's opinions in both cases, Justice Douglas dismissed the contentions of Texas that it entered the Union under conditions differing from those applied to other states and held that the federal Government had paramount rights in the submerged lands on the basis of the California decision.

Douglas rendered the Louisiana decision first, noting that "the question here is not the power of a state to use the marginal sea or to regulate its use in absence of a conflicting federal policy; it is the power of a state to deny the paramount authority which the United States seeks to assert over the area in question.

"The marginal sea is a national, not a state concern. National interests, national responsibilities, national concerns are involved. The problems of commerce, national defense, relations with other powers, war and peace focus there. National rights must therefore be paramount in that area."

There is no reason, Douglas continued, why Louisiana should stand on a better footing than California, and there are no material differences in the preadmission or postadmission history of Louisiana that make her case stronger than California's.

"Equal footing."—In the Texas opinion, Douglas again referred to the "equal footing" contention, holding that it "negatives any implied, special limitation of any of the paramount powers of the United States in favor of a state."

Conceding that, as a republic, Texas had not only full sovereignty but also ownership of the land underlying the marginal sea, the opinion held that when Texas entered the Union she became a sister state on an equal footing with all the other states.

"That act concededly entailed a relinquishment of some of her sovereignty," Douglas commented. "The United States then took her place as respects foreign commerce. The waging of war, the making of treaties, defense of the shores, and the like. In external affairs the United States became the sole and exclusive spokesman for the nation.

"We hold that as an incident to the transfer of that sovereignty any claim that Texas may have had to the marginal sea was relinquished to the United States." In short, he added, this is an instance where property interests are so subordinated to the rights of sovereignty as to follow sovereignty.

Further, Douglas said, once low-water mark is passed the international domain is reached, and property rights must then be so subordinated to political rights as in substance to coalesce and unite in the national sovereign.

"Today the controversy is over oil," said the opinion. "Tomorrow it may be over some other substance or mineral, or perhaps the bed of the ocean itself. If the property, whatever it may be, lies seaward of low-water mark, its use, disposition, management, and control involve national interests and national responsibilities. That is the source of national rights in it."

In both opinions Douglas noted that the two states have claimed jurisdiction beyond the old 3-mile limit, but he said the court was intimating no opinion on the power of a state to extend its territorial limits in this way, and that the subject of state boundaries has no bearing on the issue before the court in the oil cases. He added:

"If, as we held in California's case, the 3-mile belt is in the domain of the nation rather than that of the separate states, it follows that the ocean beyond that limit also is.

"The ocean seaward of the marginal belt is perhaps even more directly related to the national defense, the conduct of foreign affairs, and world commerce than is the marginal sea. Certainly it is not less so."

The dissent.—In their dissent from the majority opinion, Justices Reed and Minton objected to the court's interpretation of "equal footing" as never before having been interpreted to take away from a newly admitted state property that it had theretofore owned.

"I see no constitutional requirement that this should be done and I think the resolution of annexation left the marginal sea area in Texas," Reed said.

"In my view, Texas owned the marginal area by virtue of its original proprietorship; it has not been shown to my satisfaction that it lost it by the terms of the resolution of annexation.

"The needs of defense and foreign affairs alone cannot transfer ownership of an ocean bed from a state to the federal Government any more than they could transfer iron ore under uplands from state to federal ownership.

"National responsibility is no greater in respect to the marginal sea than it is toward every other particle of American territory."

Frankfurter's views.—In his separate statement, Justice Frankfurter said he still does not agree with the reasoning in the California decision but the issue is no longer open. However, he noted, this week's decisions go further than that case, in which the court refrained from recognizing the Government's claim of ownership.

He agreed with Reed that the lands in controversy were part of the domain of Texas when she was on her own, Frankfurter said. "The court now decides that when Texas entered the union she lost what she had and the United States acquired it," he commented. "How that shift came to pass remains for me a puzzle."

In both cases the court gave the federal and state governments until September 15 in which to submit to it a form of decree to carry the opinions into effect. Word reached Washington from Texas, however, that that state would seek a rehearing which, if granted, would extend the time for the filing of a decree until after the court had again considered the issue.

California situation.—In the California decision 3 years ago the court also directed state and federal governments to file a form of decree, but no such decree has yet gone into

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effect. Instead, the two governments are still attempting to fix the low-tide mark and the boundaries of bays and harbors. Offshore oil operations are continuing there as before the decision, with all funds formerly payable to California going into a special account to be disposed of later.

The same situation may prevail with Texas and Louisiana offshore operations until Congress enacts legislation. At present the Department of Interior, which administers other federal lands, has no specific authorization to lease or otherwise regulate offshore oil lands, as such lands are neither part of the public domain nor "acquired" lands in the usual meaning of those terms.

Some Justice Department attorneys are of the opinion that the executive branch of the Government could exercise jurisdiction over offshore oil operations in the Gulf of Mexico without specific legislation because of a 1945 presidential proclamation claiming United States jurisdiction over all marginal coasts out to the edge of the Continental Shelf.

A bill to give the states clear title to offshore oil out to their originally claimed boundaries but retaining federal control beyond has been reported by the House judiciary committee. Supporters may press for action on this at the present session of Congress despite this week's decision in the Texas and Louisiana cases.

Gulf Coast Reaction

Offshore operators mum awaiting text of opinions; Texas officials say they will seek court rehearing immediately

Leigh S. McCaslin, Jr.

HOUSTON. — Oil companies with offshore operations in the Gulf of Mexico were reluctant to comment immediately on the federal Government's victory in the tidelands cases.

Top officials of major companies here told the Journal that they would have to see the texts of the opinion before drawing any conclusions.

In Austin, however, Atty. Gen. Price Daniel told the press that Texas will immediately ask a rehearing of its case before the United States Supreme Court. Daniel reserved further comment until he has a chance to see the entire opinion. Land Commissioner Bascom Giles, who has also been a leader in the state's fight to retain title, simply commented: "That's terrible."

A check of scouting reports here reveals that there are only 13 active drilling operations in the Gulf of Mexico at the present time. All of the activity is confined to Louisiana waters. This compares with 27 at this same time last year. These figures include drilling platforms under construction (of which there is only one at present).

Humble Oil & Refining Co. and Magnolia Petroleum Co. each have four operations while Superior Oil Co., Phillips Petroleum Co., the California Co., and Kerr-McGee Oil Industries, Inc., each have one.

Although never stated for publication, there have been indications over the past year that many companies were hoping for any kind of a decision in the tidelands case. Their primary concern was settlement regardless of whether it meant state or federal ownership. Earlier in the fight, the sentiment of the operators had been strongly behind the states, but as the months went by this changed. A clear-cut title and a set of development regulations seem to be the current aim.

Questions remain.—Whether this aim will be achieved soon, however, is a question. So far as could be learned here, the court's opinion simply asserted that the federal Government has paramount, or overriding, rights to offshore oil reserves but did not draw a clear line of distinction between federal rights and the powers left to the states, if any.

Some attorneys took the view that further litigation may be necessary to remove all doubts on this point.

Both Texas and Louisiana were ordered by the Supreme Court to file decree forms to carry out the decisions, but some doubt was expressed that agreements could be reached by the deadline of September 15. It was recalled that in the case of California no decree has yet been agreed upon and a special master is still taking evidence for this purpose.

Many persons here considered it very unlikely that Congress will enact regulatory legislation before the end of this session, and in the absence of such legislation it is felt doubtful that any federal agency would have authority to lease offshore lands or interfere with current operations which are proceeding under state leases and regulations.

The general opinion was that some sort of interim working agreement would be made between the state and federal governments under which current oil operations would continue as at present.

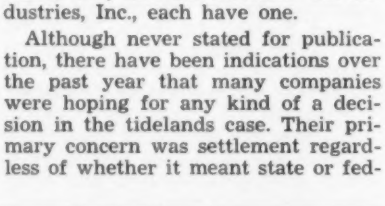
Tax Tattler

Cardboard coin to give the lowdown to U. S. motorists

AMERICAN motorists are going to be told quite plainly just how much of the money they spend for gasoline goes to the state and federal governments as taxes.

The American Petroleum Institute is now preparing a "tax teller coin" campaign and has invited 150 companies which market gasoline to participate. The plans call for the tax-telling "coins" to be handed to motorists at service stations with their change. Advance interest indicates that more than 75,000,000 "coins" will be purchased by oil companies and distributed, according to Baird H. Markham, director of the American Petroleum Industries Committee.

Markham, explaining the campaign, pointed to the results of the A.P.I.'s recent public-relations study, which showed that 60 per cent of the people don't realize how much gasoline taxes cost them and that since 1946 there has been a 200 per cent increase in the number of people of the opinion that gasoline prices are too high.



A letter to oil companies outlining the plan says its purpose "is to impress upon the industry's customers the truth—that gasoline is cheap, only the tax is high."

Tidelands Study

Agreement on methods for California settlement sought

WASHINGTON. — Department of Justice representatives and California state authorities met here last week with William H. Davis, special master appointed by the Supreme Court to recommend the area in which the federal Government has paramount rights under the 1947 tidelands decision, to discuss a report which he is now preparing for the court.

The meeting was called by Davis to receive criticism and suggestions regarding those portions of his report which will outline the conflicting contentions of the Government and the state regarding the boundaries of the seven areas in dispute and the criteria to be adopted for the determination of the ordinary low-water mark of the California shore line.

Justice Department officials made

it clear during the meeting that the Government is anxious, if possible, to have the boundary dispute settled without a survey. They sought unsuccessfully to have the whole matter limited to three particular segments, the only areas involved in the case in which oil is being developed.

California officials, on the contrary, opposed any proposal to adjudicate the issue by formula instead of survey. They said that while oil is involved in only three segments they would like to have a survey of the entire 104 segments which the state contends are inland waters.

After some discussion of the point, Solicitor General Philip B. Perlman said the Government merely wants to have the three oil-bearing areas adjudicated first and has no objection to subsequent adjudication of any or all of the 104 areas claimed by the state. After the principles are laid down on these three, he said, the Government will be willing to stipulate on others as suggested by California.

Major questions involved in the determination of whether the federal Government or the state is entitled to the areas under dispute are: whether the boundary is to follow the irregular shoreline or run outside all ports, bays, harbors, etc., and along the seaward side of the outermost offlying rocks and islands; whether the mean of all low waters, as contended by the Government, or the mean of lower low waters, as urged by the states, shall be chosen; and the treatment to be accorded where artificial changes have occurred in the shoreline since 1850.

Davis confined the discussion to those portions of his proposed report dealing with the facts in the case, and did not disclose what his findings and recommendations may be.

Carbon-Black Study

WASHINGTON.—The National Security Resources Board has undertaken a staff study of the probable supply and requirements of carbon black in the event of war, with Harvey Titus, New York chemist and attorney and president of the Carbon Black Export Association, to direct it as consultant.

The inquiry will include a survey of present facilities for the manufacture of carbon black and of factors that might increase or reduce its availability.

A major subject of study, it was disclosed, will be the supply of natural gas, the principal raw material for carbon-black production. Other uses for gas have been increasing at a rapid rate, raising questions concerning the future ability of the carbon-black industry to supply sufficient material to meet tire production schedules in the event of an emergency.

WATCHING WASHINGTON

Bertram F. Linz

June Imports Test

The first test of strength over the oil import situation is expected to come before the end of this month. An effort will be made in the House, during consideration of the tax-reduction bill now being perfected by the ways and means committee, to include an increase in the import tax to $1.05 per bbl.

Supporters of this method of curbing imports are highly encouraged by the course of hearings now being held by House and Senate committees on the import problem and believe they have a good chance of getting the increased tax approved by the House. Since an effort to put a curb on imports failed in the Senate last year by only one vote, they are confident that if the issue reaches the upper chamber sufficient strength will be mustered among members from states where the effect of imports of many commodities is being felt to insure favorable action.

Failing to get a higher tax incorporated in the revenue bill, however, many members admit that the only relief foreseeable, and that negligible, will come from abrogation of the Mexican reciprocal-trade agreement which has been in the works for several months. This would restore the original tax of 21 cents a barrel on all imports above the 5 per cent quota provided for in the trade pact with Venezuela.

So far, the administration has not indicated its position on oil imports, but some members of Congress believe that, in view of the increasing seriousness of the situation, the President might accept legislation of a limiting nature.

Maybe We'll Miss One

Chances for a Federal Trade Commission investigation of the oil industry are pretty dim in view of opposition from important quarters.

Strong objections to the investigation have been raised by the Department of Justice, which claims it would delay new prosecutions of oil companies and interfere with several investigations of its own. A major point raised by the department is that the FTC could take over records it already has compiled which it does not want to release to any other government agency.

Equally important is the dislike among members of the House interstate commerce committee for the idea of letting the commission make an investigation which they believe can be made equally well and probably quicker and at less cost by their own committee.

The House committee has to pass on the Cannon resolution to authorize the probe and could readily pigeonhole it or, if forced, send it along to the floor with an adverse report. The Missouri congressman is chairman of the House appropriations committee and could include funds for the investigation in the appropriation bill next year if the FTC proposed and secured Budget Bureau approval of the inquiry, without returning to the interstate commerce committee.

The only support which the investigation has been given so far has come from farm organizations and some oil jobbers and retailers.

Study in Steel

The administration's panacea for all industrial ills — the industrial stabilization bill—may be trimmed down a bit and given a shot of adrenalin if steel continues its present runaway course.

Specifically, there is talk that President Truman's 1948 proposal for construction of government steel mills may be revived. Proposed originally to meet a situation of scarcity only relatively worse than that which prevails now, the idea later was offered to combat a threatened recession which never materialized.

The steel industry is working currently at a rate somewhat in excess of capacity and is nowhere in sight of demand. Scrap prices are heading for the moon, conversion deals and premium prices are common, and the 1948 gray market may be back again any time.

Just where tubular products used by the oil and gas industries fit into the picture is not quite clear, but the producing mills haven't been able to get abreast of demand any time since the war.

The present situation is irritating but not yet disturbing, but if the gap between steel production and demand continues to spread through the remainder of the year it could become a depressing influence on industry generally. If that occurs, the President is likely to ask for authority to deal with the matter when the new Congress convenes next January.

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Imports Crescendo

Two committees still receiving complaints against foreign oil; Neely expected to submit critical report this month

WASHINGTON.—Domestic oil men traveled from one side of the Capitol to the other last week to tell Senate and House committees how imports are creating distress in various segments of the industry.

Two labor subcommittees, one headed by Sen. Matthew M. Neely of West Virginia and the other by Rep. Tom Steed of Oklahoma, are holding extended hearings on the effect of imports.

The Neely group is interested primarily in the coal industry which, along with the railroads, has complained that oil imports are helping John L. Lewis alienate its markets, but the Steed subcommittee apparently will go into the situation of every industry—and there are many—adversely affected by imports of foreign goods.

Stacked cards.—Just how many cards are stacked in the Senate inquiry was let out by Neely who, following reports that he would not call representatives of the importing oil companies to give their side of the case, said last week he would hear them if they asked. But Neely showed very plainly what he thought of the importers and it was clear they would have little chance of changing his position if they testified.

Neely's subcommittee is scheduled to make its report before the end of this month, and is expected to excoriate the importing oil companies who are supplying markets which the coal industry feels should be dedicated to it, and to tell the Senate that unless imports of residual fuel oil are curbed the coal industry will be ruined and the national security threatened.

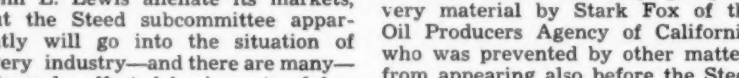
California's stake in the situation along the eastern seaboard was described before the Neely group as very material by Stark Fox of the Oil Producers Agency of California, who was prevented by other matters from appearing also before the Steed subcommittee, which had postponed its hearing because of the death of Labor Committee Chairman John Lesinski of Michigan.

Fox told Neely that since August 1948 employment in the California oil industry has declined 17.3 per cent, some 3,000 wells have been shut in, and production has been reduced approximately 90,000 bbl. per day, because of imports of foreign residual, of which large quantities were being shipped from California to the East Coast.

Before both subcommittees, coal-industry representatives charged they were being "strangled" by the "unfair competitive means" adopted by the oil-importing companies to invade the traditional markets for bituminous coal. A large number of domestic oil groups sent spokesmen to the hearings to outline the steadily deteriorating conditions which they said they are facing as a result of imports.

State is panned.—On both sides of the Capitol, committee members panned the State Department for the part it has played in encouraging the importing companies, and department officials are scheduled to appear before both subcommittees this week to defend their position.

It is expected that questioning will be based on the recent statement of Asst. Sec. Willard L. Thorp before the House Interstate Commerce Committee in which he gave the impression that the department feels that the fact the companies are American companies and have American stockholders justifies government support of policies which independent operators charge are ruinous.



RECEIVES HONORARY DEGREE.—Burton Elias Hull, center, president of Trans-Arabian Pipe Line Co., received an honorary doctor of engineering degree from Texas A. & M. College in commencement exercises June 2. The degree was awarded in recognition of "his distinguished leadership in transportation of petroleum products by means of pipe lines, and his outstanding performance in the construction and operation of the world's greatest facilities of this nature, and his contributions to the safety and welfare of his nation and its people through these accomplishments." A native of Navasota, Hull graduated from A. and M. in 1904. He has served as vice president of The Texas Co. and president of Texas Pipe Line Co. He surveyed and designed the Big Inch and Little Inch pipe lines. Pres. F. C. Bolton, left, presents him the degree, as H. L. Heaton, registrar, places the hood over his shoulders.

Co-Op Tax Bill Loses Out

WASHINGTON. — Efforts to have cooperatives taxed on an equal basis with conventional industry last week failed to secure approval by the House ways and means committee. The committee, however, did close one loophole in the cooperative structure by voting for a 10 per cent withholding tax on patronage refunds and stock dividends paid to members.

It was conceded that the withholding tax is merely more or less of a gesture toward tax reform on the cooperative field since it would not affect the cooperatives themselves. All it would do would be to insure that the Government collected some tax from individuals who might resort to a little finagling in making their returns.

Smith to Remain on FPC

WASHINGTON.—President Truman has nominated Nelson Lee Smith of New Hampshire for another term as a member of the Federal Power Commission of which he formerly was chairman.

Smith was replaced as chairman by Mon C. Wallgren last month under one of a number of reorganization plans which the President go through Congress in spite of efforts to stop them.

During the long fight in the commission over the Kerr bill, Smith supported the legislation, frequently tangling with Wallgren's predecessor, Leland S. Olds.

Basing-Point Decision

Senate sends O'Mahoney bill to President; veto considered possible; author says Indiana Standard case not affected

WASHINGTON.—By a surprise vote of 43 to 27 the Senate last week completed congressional action on the O'Mahoney bill to permit sellers to quote delivered prices and absorb freight, and sent the measure to the White House for President Truman's approval.

The vote came after a week of debate in which opponents of the measure brought to bear every argument they could muster regarding the monopoly-inducing conditions which they said would be created by restoring the right to quote delivered prices.

Surprise vote.—As the Senate prepared to vote, industry observers who had kept in close touch with the situation admitted they could count at best on getting the bill through by a margin of 3 votes, largely because at least 15 of the members who were out of the city were known to be in favor of it. The 16-vote margin by which the Senate passed the bill created considerable surprise in business circles.

During the course of long consideration and frequent extended debates in House and Senate, opponents of the legislation conducted a campaign against it much like that waged against the Kerr natural-gas bill. As in the case of the Kerr bill, the President is reported ready to accept the measure but, remembering what happened to the gas act, many members of Congress are anticipating the possibilities that he will veto the O'Mahoney bill.

The legislation was originally sought 2 years ago to offset the effects of the Supreme Court decision in the Cement Institute case, which outlawed basing-point pricing. Surviving bitter attacks, the bill got through both House and Senate last year but was held up by inability of conferees to come to a satisfactory agreement. The conference report was approved by the House before adjournment of the 1949 session but was turned down by the Senate last January and the matter had to be thrashed out again. A modified agreement was finally reached, and the bill was brought up in the Senate again late last month.

During the course of the Senate debate, Sen. Joseph C. O'Mahoney of Wyoming, who led the fight for adoption, assured members that the bill would not upset the court decision in the Standard Oil Co. (Ind.) case, in which a contention of good faith had been rejected in connection with pricing practices employed by the company in the Detroit area. As the Senate passed the bill, the Supreme Court was preparing an opinion on the company's appeal from that decision.

Started by FTC.—The whole argument over basing-point prices originated in the Federal Trade Commission, which was split 2 years ago by internal dissension over a proposed campaign to outlaw all forms of pricing except f.o.b. mill. The commission consistently fought the O'Mahoney bill, but the Department of Justice, which has never felt that the matter in which prices are quoted, per se, was illegal, gave the measure its support.

Under the bill, a seller would be permitted to quote delivery prices and absorb freight charges, and could offer as an adequate defense to charges of price discrimination a showing that the lower prices were announced in good faith to meet the equally low prices of a competitor. All of the bars against the use of delivered prices to suppress competition, establish a monopoly, etc., would be preserved.

***NEW USE FOR OLD BUILDING.**—An oil museum containing early-day drilling, producing, and refining equipment and old documents involved in California's oil operations around the turn of the century was dedicated June 3 by officials of Union Oil Co. of California. The museum, located at Santa Paula, is housed in the two-story building in which Union was incorporated 60 years ago. Included in the displays is this 30-year-old wooden cable-tool rig, used in nearby Barksdale field, being explained to a visitor by Basil Kantzer, manager of Union's Pacific Coast field operations. Except for the height of the derrick, the rig is completely assembled as if for drilling. Also shown in the museum are old wooden sucker rods, a wooden pumping jack, and many other items of equipment which saw service in the 1800's. In making the presentation, Reese H. Taylor, Union president, said that by creating and sponsoring the museum it was hoped that the colorful story of the development of California oil would be preserved. Union plans to turn over the museum eventually to some organization representing the entire oil industry. It is believed that Petroleum Production Pioneers, which holds an annual meeting in Santa Paula, will be that organization.*

XUM

How Much Lobbying?

Committee chairman hopes to find out, puts bee on 166 companies for immediate details of their expenditures

Bertram F. Linz

WASHINGTON.—Ten large oil corporations were asked last week to furnish the House select committee on lobbying activities with detailed information regarding their expenditures over the past 3 years to influence policy or public opinion on national issues.

The companies were among 166 corporations, including two rubber concerns and several natural-gas companies, whose presidents were asked by committee chairman Frank Buchanan of Pennsylvania to submit itemized accounts of the cost of maintaining Washington offices, travel to and from Washington, printed material, and advertising dealing with public issues which might be the subject of federal legislative action, contributions to organizations which may promote national legislative objectives, and other payments for attempts to influence passage or defeat of legislation.

Companies involved.— Companies asked to provide this information included Cities Service Co., New York; Gulf Oil Corp., Pittsburgh; Humble Oil & Refining Co., Houston; Shell Oil Co., New York; Socony-Vacuum Oil Co., New York; Standard Oil Co. of California, San Francisco; Standard Oil Co. (Ind.), Chicago; Standard Oil Co. (N. J.), New York; Sun Oil Co., Philadelphia; and The Texas Co., New York.

Other corporations queried included the Columbia Gas System, New York; Lone Star Gas Co., Dallas; B. F. Goodrich Co., Akron, Ohio; and Goodyear Tire & Rubber Co., Akron.

The committee appeared particularly interested in company contributions which are engaged in fighting for or against legislation, and specifically asked regarding expenditures in connection with the American Enterprise Association, America's Future, Inc.; Committee for Constitutional Government, Constitutional Educational League, Constitution and Free Enterprise Foundation, Economists National Committee for Monetary Policy, Foundation for Economic Education and the Public Affairs Institute.

Buchanan pointed out that his committee has been ordered to investigate all lobbying activities intended to influence, encourage, promote or retard legislation, and said the questionnaire to the 166 business firms should provide "reliable information as a guide to us in determining whether the Federal Regulation of Lobbying Act needs improvement."

Industry critical.— Industrial circles immediately charged Buchanan with having engaged in a fishing expedition.

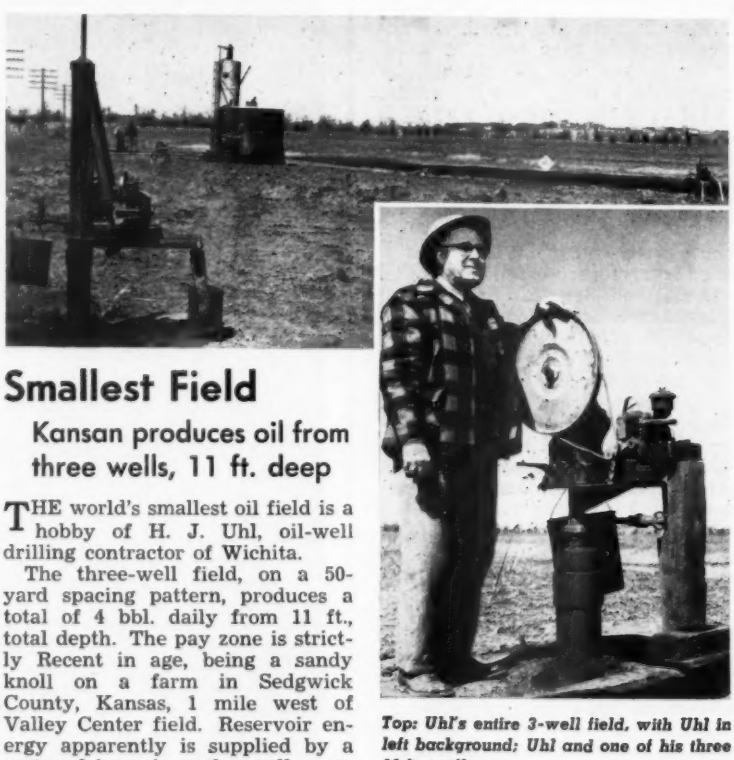
Industry quarters denominated the whole thing an effort to find out how much the companies have contributed to such organizations as the United States Chamber of Commerce, National Association of Manufacturers, and national, state and local trade organizations.

Several organizations are reported to have already consulted their lawyers, who feel that Buchanan has exceeded any authority granted the committee. They also have raised the question of what Buchanan can do if a company refuses to comply with his request for information and express the off-the-cuff opinion that he could do nothing.

Indiana Case Undecided

WASHINGTON.—The antitrust case against marketing practices of Standard Oil Co. (Ind.), which was being watched with great interest by marketers of oil and other products, has been set for reargument at the next term of the Supreme Court.

Apparently the court was unable to reach an agreement by the time of its final sitting, June 5. The decision on appeal was rendered by Justice Minton before he was elevated to the Supreme Court, and it is surmised that he disqualified himself and that the other justices were evenly divided.



Top: Uhl's entire 3-well field, with Uhl in left background; Uhl and one of his three 11-ft. wells.

Smallest Field

Kansan produces oil from three wells, 11 ft. deep

THE world's smallest oil field is a hobby of H. J. Uhl, oil-well drilling contractor of Wichita.

The three-well field, on a 50-yard spacing pattern, produces a total of 4 bbl. daily from 11 ft., total depth. The pay zone is strictly Recent in age, being a sandy knoll on a farm in Sedgwick County, Kansas, 1 mile west of Valley Center field. Reservoir energy apparently is supplied by a water drive, since the wells produce only when it rains.

Surface seepages led to discovery of the field. Using drilling equipment consisting of a post-hole digger, Uhl drilled 35 dry holes but got commercial production in only 3, which are located on the top of the formation and do not produce during dry weather. Wells were completed by setting 6-in. casing at 11 ft., TD. Producing equipment consists of 2-in. water pumps powered by washing-machine engines.

Theories differ as to the origin of the oil. Three crude-oil pipe lines run close to the field, but they have been checked without locating leaks. Some believe the oil may come from an old well which has been plugged, while others think it may be reaching the surface through a freak rock formation, although water associated with the crude is fresh instead of salt.

Of his miniature oil field, Uhl says: "Not much profit, but it's fun anyway."

In this case the Federal Trade Commission charged Standard with discriminating among dealers by allowing unusual discounts to Detroit dealers known to be price cutters. The lower court rejected the company's defense that the lower prices were made in good faith to meet competition because these dealers would have purchased gasoline from other suppliers at similarly low prices if it had not met these competitive offers.

Drop in Imports

April figures show decline of 5 per cent; exports up

IMPORTS for April decreased almost 5 per cent and exports increased 21 per cent according to data of the Department of Commerce.

Crude and products, imported into continental United States, averaged 837,000 bbl. daily compared with 879,000 bbl. for March and 603,000 bbl. daily for April 1949.

Imports of crude were off 21,000 bbl. daily from March but up 52,000 bbl. daily from April of last year. Residual imports averaged 347,000 bbl. daily compared with 187,000 bbl. daily for April a year ago. This represents an increase of 85 per cent over the previous April but is a decrease from the record of 374,000 bbl. daily set in March. The gain for other products was due to increased imports of unfinished oil.

Crude exports were greater than in March but the total for the month was about 700,000 bbl. less than in April of last year. The major loss, compared with last year, was in gasoline, a decrease of 1,442,000 bbl. Lube-oil exports for the month totaled 1,256,000 bbl., greater than either March or April 1949.

IMPORTS INTO CONTINENTAL UNITED STATES
(Thousands of barrels)

	Apr. 1950	May 1950	Apr. 1949
Crude—			
Mexico	517	889	660
Colombia	1,028	1,587	935
Venezuela	8,578	9,634	8,095
Kuwait	2,447	1,506	1,526
Saudi Arabia	1,217	1,308	1,032
Other	....	....	....
Total crude	13,787	14,924	12,248
Daily average	460	481	408
Products—			
Residual fuel	10,417	11,606	5,621
Other products	899	726	211
Total products	11,316	12,332	5,832
Daily average	377	398	195
Total all oils	25,103	27,256	18,080
Daily average	837	879	603

EXPORTS*
(Thousands of barrels)

	Apr. 1950	May 1950	Apr. 1949
Crude	2,969	2,153	3,655
Gasoline	1,911	1,212	3,353
Distillate	844	950	1,011
Lube oils	1,256	1,123	1,121
Other products	1,510	1,795	1,346
Total all oils	8,490	7,233	10,486
Daily average	283	233	350

*Excludes shipments to territories.

MIDWEST

Attractive Pool

Unitized town-lot field has high, consistent output

By Neil Williams

PLAINVILLE, Ind.—The scene for several months of one of Indiana's most active drilling plays of recent years, Plainville pool in northwestern Daviess County, in the south-central part of the state, now is paying off with unusually consistent production.

Although productive area is not large, embracing less than 640 acres, individual wells, with initial outputs of from 100 to more than 300 bbl. per day each and prospects of unusually slow production decline curves, are proving particularly attractive to their operators.

Discovered last December, the pool now has 29 completed oil wells with production from the Aux Vases and McClosky formations at depths of 700 to 800 ft. Eight additional wells have been completed in the deeper gas-producing Salem lime at depths of 1,100-1,200 ft. Gravity of the oil is 38° A.P.I.

With production at relatively shallow depths, wells have been drilled and completed in from 7 to 10 days each. This has expedited development and made possible rapid proving up of the pool. Use of light equipment, absence of drilling difficulties, and fast time have resulted in unusually low development costs.

Productive area embraces the entire townsite of Plainville, a farming community, which, before the discovery of oil at its outskirts, had a population of 250 persons. Early unitization of the townsite permitted proving up the area with a minimum of wells, forestalling a close, wasteful town-lot drilling play.

Map showing location of Plainville pool.

Currently, only three rigs are running in the pool. One of these is being used in deepening a well, originally completed as a Salem lime gasser, in exploration for possible production in the Devonian lime or other lower horizons.

The pool was opened by National Associated Petroleum Co., which controls the major share of the acreage, particularly outside the townsite. The status of development by operators to date follows:

	Wells completed: Oil*	Wells completed: Gas†	Wells drilling
National Associated Pet. Co.	21	3	3
B-S-L Drilling Co.	6	2	0
Skiles & Barclay	0	1	0
Walter Duncan	2	1	0
Barclay-Indiana Oil Co.	0	1	0
Total	29	8	3

*Includes 25 McClosky lime wells, 3 Aux Vases wells, and 1 dual-zone, McClosky and Aux Vases well. †Salem lime production.

This is National Associated Petroleum Co.'s discovery well which started the spirited drilling program in Plainville. Almost all of the residents share in the production as a result of unitization of the town-lot field.

XUM

Fuel-Saving Engine

S.A.E. told new TCP development may mean more miles per gallon, more usable fuel from each barrel of crude oil

FRENCH LICK, Ind.—A knockless automobile engine yielding at least 30 per cent greater mileage and using fuels of any octane or cetane number was envisaged last week at the annual summer meeting of the Society of Automotive Engineers.

Powered by a Texaco Combustion Process engine, this car of the future might utilize any petroleum fraction in the 100°-600° F. boiling range, thus increasing by 30 per cent the volume of fuel available to automotive transport from a barrel of crude. *(The Oil and Gas Journal, March 2, page 21).*

The progress report on the TCP engine, presented by E. M. Barber and W. T. Tierney, of The Texas Co., and Blake Reynolds, of Texaco Development Corp., highlighted events of the meeting for the petroleum industry.

In the first presentation of the new TCP engine before the S.A.E., the engineers engaged in its development stated:

1. The Texaco Combustion Process (TCP) is a method for operating the combustion phase of the cycle of a reciprocating internal-combustion engine so that knock does not occur regardless of the octane number of the fuel or of the compression ratio or supercharge of the engine.

2. TCP is relatively insensitive to fuel volatility, and it readily handles fuels of a broad boiling range, 100° to 600° F.

3. The features of TCP that prevent knock also allow a wide range of mixture strengths to be burned; this results in high efficiency at part load and in load control by mixture strength.

4. TCP's elimination of knock, its toleration of wide-boiling-range fuels, and its ability to burn lean mixtures make it a basis for substantial improvements in achieving greater power per unit of engine size, more miles per gallon of fuel and more gallons of fuel per barrel of crude petroleum.

Favorable features.—To realize these benefits, engines must be built to exploit one or more of the favorable features of TCP. These include:

1. As the result of TCP's knock elimination, compression ratio may be increased without regard for the octane number of the fuel.

2. As the result of TCP's knock elimination, supercharge may be employed, in combination with high-compression raito if desired, without regard for the octane number of the fuel. This may be done, for example, with a small engine to reduce losses at the load of average use; with a larger engine to obtain torque variation without a complicated multi-speed transmission; or simply to obtain high power from a given size of engine.

3. TCP's ability to burn lean mixtures will result in a favorable part-load fuel economy in almost any TCP engine application.

4. TCP's ability to control load by mixture strength, without air throttling, makes it attractive for two-cycle engines which have many desirable characteristics when the mixture strength method of load control can be employed.

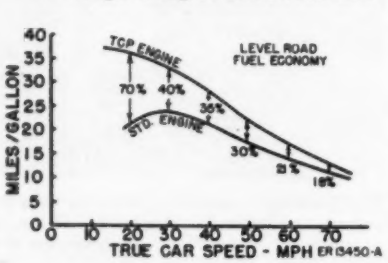
5. A TCP engine can utilize fuels having no octane-number specification and a broad boiling range. The yield of such fuel from most crude oils can be substantially greater than the combined yields of motor gasoline, aviation gasoline, and diesel fuel meeting current octane number, cetane number, and volatility specifications.

Next step.—These conclusions, based on laboratory findings from operation of single-cylinder TCP engines, support the next step in development of the radical new engine—design, construction and testing of a multi-cylinder model. This next phase of development is now getting under way at the company's Beacon, N. Y., laboratories.

"The most elementary form of TCP engine—four cycle, poppet valve, naturally aspirated—will exploit a minimum of TCP's potential," the authors said.

An accurate estimate of such an engine's resultant performance, however, offers a fair basis for a preliminary comparison, in their opinion. The accompanying figure shows a comparison between the high-gear performance of a popular automobile powered by its conventional 6.6 compression ratio engine and by a TCP engine.

"Although doing so somewhat minimizes TCP's performance advantages, the TCP performance is predicted on using the same bore, stroke and gear ratio as the conventional engine." The figure indicates that the TCP engine will at least equal the full-throttle performance of the conventional engine. It also suggests that, with normal driving habits, the fuel economy of the TCP engine will be about 30 per cent greater than that of the conventional engine.



Automatic transmissions. — Addition of the Ford and Mercury to the present nine makes of cars now offering automatic transmissions as standard or optional equipment will further spur the market for transmission fluids, it was indicated at the meeting. A more far-reaching effect on the industry was predicted in the possible adaptation of automatic transmissions to future cars.

The contribution of the automatic transmission was significantly limited to the "ease, comfort, and smoothness of driving our cars," with little mention of the power they absorb.

A. H. Deimel, in his paper on automatic transmissions, said: "Just as the spark advance is now regulated automatically, it is conceivable that eventually throttle position and speed and torque ratio will also be regulated automatically, subject merely to the command of a speed control pedal. In this manner, engine speed would be determined by the ratio needed to meet the power requirements, operation being to a greater extent at lower engine speed and wider throttle opening, with resultant better fuel economy."

New Use for Coke?

Members of the American Institute of Chemical Engineers attending the Boston regional meeting last week were told of a possible new use for coke in the manufacture of pure carbon dioxide for dry ice, fire extinguishers, and carbonated beverages.

The new process employs the fluidized powder technique used widely in catalytic cracking. Powdered coke and iron ore are mixed and fluidized with carbon dioxide. The coke is converted to carbon dioxide, and the iron oxide is reduced. Withdrawn continuously, the iron is again "regenerated" by contact with oxygen from the air.

This new process improves on the existing method for carbon dioxide, in that it eliminates the necessity for removal of nitrogen. In the straight combustion of coal or other fuels, the produced carbon dioxide is mixed with inert nitrogen and must be removed by costly absorption and later heat release.

Texaco Election

Independent union defeats C.I.O., A.F.L. at Eagle Point

George Weber

AN independent union defeated affiliated groups of both the C.I.O. and A.F.L. last week in an NLRB election to determine who will represent the employes of The Texas Co. at the new Eagle Point refinery, Westville, N. J.

The Eagle Point Employes Association scored a majority in the three-way contest, with 193 votes out of 336 cast. The Oil Workers International Union (C.I.O.) received 83 votes and the A.F.L.-affiliated International Union of Operating Engineers polled 60. Of the 365 eligible voters, 336, or 92 per cent, participated in the election.

Eagle Point is the first major refinery to be built by The Texas Co. on the East Coast. The plant, rated at 40,000 bbl. per day crude charging capacity, was placed on stream about the first of the year.

Eagle Point is also the first large refinery to be represented by an independent union, although numerous terminals in the East and South are so represented. The International Union of Operating Engineers represents workers at the company's Amarillo, Tex., refinery, and the C.I.O. union represents all other major plants, at Los Angeles, Calif.; Sunburst, Mont.; West Tulsa, Okla.; Casper, Wyo.; El Paso, Port Arthur, and Port Neches, Tex.; and Lawrenceville and Lockport, Ill.

Strike situation.—As Texaco's C.I.O. strike entered its third month, workers were returning at several points and partial operations were being resumed.

At Lawrenceville, Ill., H. S. McCray, superintendent, said the plant was operating at 50 per cent capacity and full operations were expected within the next few weeks. About 45 per cent of the refinery's employes are now working, he said.

The Lockport refinery was in partial operation. T. A. Mangelsdorf said additional units will be "started from time to time and additional workers called back, depending upon circumstances as they develop."

At Casper, Superintendent A. E. Higgs said the refinery there was operating at 50 per cent capacity with approximately 30 per cent of the hourly workers at their jobs.

The company's Port Arthur works was reported by F. L. Lawless, works manager, to be "completely down." "Only excluded employes and some members of nonstriking unions are reporting," Lawless said.

. . Meetings between Local 23 and representatives of the Port Arthur works, which have been in progress since May 18, were recessed Monday until 10 a.m. June 9. In Monday's meeting the company submitted to the union a written proposal calling for a 2-year contract instead of the customary 1-year contract.

Higher Octane

Ethyl raises requirements for fuel-bearing trademark

LICENSEES of the Ethyl Corp. have received notice that effective September 1 the minimum octane rating on premium "Ethyl" motor fuel will be 88, replacing the present requirement of 86. The company announcement explained:

"In order to keep abreast of the improvements in fuels and engines produced by the oil and automotive industries, and to maintain the value to you of the 'Ethyl' trade-mark, we are raising the minimum antiknock standard for gasoline sold in connection with the 'Ethyl' trade-mark.

"After September 1, 1950, the minimum antiknock quality for 'Ethyl' gasoline will be 88 octane number as determined by the A.S.T.M. Research Method, except for the specific high-altitude area defined in our letter of January 23, 1950, where the minimum octane number will be 85."

The 85-octane area includes Idaho, Montana, Wyoming, Nevada, Utah, Colorado, New Mexico, parts of Arizona and western South Dakota, Oklahoma, Nebraska, and Texas. In general the lower-octane requirement applies to areas with an altitude in excess of 3,000 ft.

Ethyl Corp.'s action follows a general upward trend in octane ratings for both premium and regular-grade motor fuels which has been particularly apparent over the past several months. In some areas octane ratings for premium motor fuels generally exceed 90 octane.

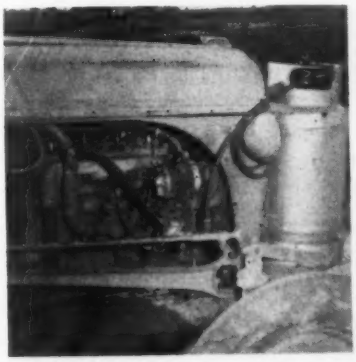
Ethyl Corp. has no minimum octane requirements for the regular-grade motor fuels using its tetraethyl lead to improve antiknock properties. The octane ratings of these regular fuels, however, have been increased by most companies so that the usual spread between regular and premium fuels of 6 to 8 points is maintained. In exceptional cases regular motor fuels of 85 and 86 octane are reported at this time.

The trend is explained as being due both to the higher compression ratios in many of the new cars and also by the spread of catalytic cracking and reforming operations at refineries.

New L.P.G. Use

Better summer demand seen in wider use on the farm

THIS farm tractor equipped to operate on liquefied petroleum gas represents the "great white hope" of the L.P.G. industry for developing a summer load to offset the winter demand peak.



Dealers report that conversion of tractors to butane and propane is spreading rapidly in many areas. Conversion units are made by a number of manufacturers and installation costs range from around $65 for a vapor-phase system for a small tractor to $250 for equipping a large tractor with a high-compression engine head and high-altitude pistons in order to burn the fuel as a liquid. Some tractor manufacturers are now equipping their machines for L.P.G. at the factory.

Farmers save in lower fuel costs and in maintenance. Butane and propane delivered to the farm costs in the neighborhood of 8 to 10 cents per gallon as compared with the tank-wagon price of 17 to 19 cents per gallon for tractor-grade gasoline, and the mileage per gallon is about the same. In addition, a tractor operating on L.P.G. does not accumulate carbon in the cylinder head and does not need to have the valves reground so often. Crankcase oil suffers no dilution, so the tractor can operate longer between changes of oil.

A tank of L.P.G. will operate a tractor about as long as a tank of gasoline, and many farmers have their own bulk storage tanks from which they can fill their tractors themselves.

XUM

NOT DEAD YET.—According to the statisticians who periodically calculate that the nation's oil reserves will be completely exhausted in 14 or 15 years, Titusville field in Pennsylvania should have been dead long since. Titusville started producing 90 years ago, but because of repressuring operations it is still in the running. At the left is one of the old wells operated by pull rods from a central power, while at the right is a pump jack in Titusville field electrified by Cities Service Oil Co.

The catalytic-type operations have enabled refiners to materially improve the octane rating of their base stocks. Some of the product pipe lines which act as common carriers have also recently increased the octane ratings of the motor fuels they transport. Octane ratings became a major factor in competitive selling last year when the threatened postwar shortages in supply ended.

Utah Gas Line Proposed

SALT LAKE CITY.—Utah Natural Gas Co. last week asked the state Public Service Commission for a permit to build a 325-mile line to bring natural gas to the Salt Lake Valley.

The company said it wants to build a 22-in. line originating in Four Corners field in southeastern Utah. The company said gas will be taken only from wells in Utah so that approval of the Federal Power Commission will not be necessary.

John A. McGuire, Lowell, Mass., company president, said substantial reserves already have been established in the Utah portion of Four Corners and that his company is prepared to further develop the area.

Preliminary construction work on the line will begin as soon as the commission will permit, he said.

Special A.P.I. Train Planned

Special train service from Chicago and Tulsa to the annual meeting of the American Petroleum Institute in Los Angeles next November has been arranged through cooperation of Santa Fe Railway Co. and The Oil and Gas Journal.

A special train will leave Tulsa Friday evening, November 10, with reservations confined exclusively to oil men bound for the convention. Beyond Ottawa, Kans., the special will be handled as a section of the Super Chief, arriving in Los Angeles at 8:45 a.m., Sunday, November 12.

The Santa Fe's regular Super Chief leaving Chicago at 7 p.m. November 10 will also be reserved exclusively for A.P.I. delegates. Returning, both trains will leave Los Angeles at 8 p.m. Thursday, November 16. The Oil and Gas Journal Special will reach Tulsa Saturday morning, and the Super Chief is due in Chicago at 1:45 p.m. that day.

The Journal's special train from Tulsa will be made up entirely of Super Chief equipment, and will offer the same service as the Santa Fe provides on its regular runs of this de luxe train. Reservations for space on these two A.P.I. trains may now be made through Santa Fe passenger agents in Tulsa or Chicago.

CANADA

Natural Gas for Toronto?

TORONTO, Ont.—Two projects for piping natural gas to Toronto are now under consideration.

E. J. Tucker, general manager of Consumers Gas Co., Ltd., of Toronto, has announced that company directors have approved entering into a contract with Tennessee Gas Transmission Co. under which, subject to the approval of the United States Government, gas would be drawn from a large pipe line to Buffalo and transported to Toronto through a transmission line to be built.

Thomas Weir, general manager of Union Gas Co. of Canada, Ltd., of Chatham, announced that his company is planning a pipe line to carry natural gas from southwestern Ontario to Hamilton and Toronto. This project would depend to some extent on consistent deliveries of Texas gas from Panhandle Eastern Pipe Line Co. Present customers in southwestern Ontario would be served by storage facilities in the Dawn field while the new transmission line would carry gas for the Toronto-Hamilton area.

Consumers Gas Co. which has been supplying manufactured gas to Toronto would, in the event of a natural-gas supply being made available, retain part of the present gas works for standby and peak load use.

Aerial Survey Started

CALGARY.—An aerial magnetometer survey of 16,000,000 acres in the Peace River area of Alberta has begun.

The industry is watching the survey for answers to the difficult problems of exploring the remote country of the north. Heavily forested or muskeg country makes ground exploration a laborious task. A precise magnetic map of the area will enable the companies to hake a valid evaluation of the magnetic method's worth.

The operation is being undertaken on a cooperative basis by Socony-Vacuum Exploration Co., Stanolind Oil & Gas Co., Imperial Oil, Ltd., and Canadian Gulf Oil Co. A fifth and possibly sixth company may share in the exploration in the near future.

The new, improved, high-sensitivity Gulf airborne magnetometer will be used for the survey, which will be flown at 1,000 ft. in a series of parallel lines spaced at 1½-mile intervals.

First Export Permit

EDMONTON, Alta.—The first permit for the export of natural gas from Alberta was issued last week to Gordon M. Plotke, Calgary.

Plotke was given a 5-year permit

to move about 15,000 cu. ft. daily by pipe line from a well on his property near the United States border to another piece of his property 300 ft. away in Montana.

Plotke has been moving the gas about 15 years, but recent legislation made it mandatory for him to apply to the provincial government for authority to continue.

Line to Winnipeg Planned

Imperial Oil, Ltd., has announced plans for construction of a 75-mile crude-oil pipe line from Gretna, Man., to Winnipeg. Purpose of the line is to supply refining facilities in Winnipeg. It will be connected at Gretna with the long Interprovincial Pipe Line Co. line being built from Alberta fields to Superior, Wis.

Initial throughput of the 10-in. line will be about 14,000 bbl. daily, with a capacity of 30,000 bbl. per day. It will cost some $2,500,000. The only pumping station required will be at Gretna, adjacent to the Interprovincial station there.

While some initial work has been delayed by flood conditions, extra crews will move in to make up lost time as soon as the flood subsides. Completion is expected late this fall or by the spring of 1951.

A newly organized Imperial subsidiary, Winnipeg Pipe Line Co., Ltd., which has been incorporated in Manitoba, will own the line.

SOUTHWEST

Pegasus Report

West Texas' most active deep field now has 10 Ellenburger producers, also claims commercial output from Fusselman

Carl F. Hoot

MIDLAND, Tex.—Pegasus field, the most active deep field in West Texas, now has 10 completed wells producing from the Ellenburger at around 13,000 ft., has set a new producing depth record for the region, and has found commercial production in the Fusselman section of the Silurian.

Although this field was slow in development because of its great depth and the fact that it costs around $300,000 to drill each well, there are now 22 wells drilling and 3 more rigging up.

Pegasus field straddles the Midland-Upton county line, and shows of oil have indicated that it may have nine pay zones. However, all commercial production to date has been from the Ellenburger, the lowest pay. Until last week, drill-stem tests in the Fusselman failed to show substantial quantities of free oil, and it was believed acidizing would be necessary. *(See The Oil and Gas Journal, April 27, page 140).*

Commercial production from the Fusselman section has been assured at Magnolia Petroleum Co.'s 2-A TXL, southeast offset to the discovery in Upton County, on a drill-stem test between 11,884 and 11,991 ft. It flowed 25.65 bbl. of 52°-gravity oil to storage in 90 minutes on gas-oil ratio of 3,540. Operators were drilling ahead at 12,072 ft., and going to the Ellenburger at last report.

West Texas' production depth record was set by Phillips Petroleum Co.'s 1-BB TXL, ninth producer in the field and second on the Midland County side, a diagonal northwest offset to the field discovery. Total depth of the Phillips well was 13,677 ft. Plugged back to 13,334 ft., the well completed for 456 bbl. of 45°-gravity oil a day from casing perforations between 13,090 and 13,200 ft. Potential gage was through 14/64-in. tubing choke.

Northeast of Phillips' 1-BB TXL, Magnolia Petroleum Co.'s 3-30 Roy Glass extended the field one location north with a production of 1,200 bbl. daily from the Ellenburger at 13,015-165 ft., flowing through ⅜-in. choke. It was the third well on the Midland County side and the tenth for the Pegasus field.

Companies developing the field and their operations are: Magnolia, 11 wells drilling and 2 rigging up; General American Oil Co., 5 drilling; Sinclair Oil & Gas Co., 1 drilling and 1 rigging up; Sharples Co., 2 drilling; Republic Natural Gas Co., 2 drilling; and Phillips Petroleum Co., 1 drilling.

The field has had a discovery allowable based on the yardstick formula of 500 bbl. per day until the fifth company well, after which it drops to 300 bbl. per day per well.

Top: Typical flowing-well hookup is this high-pressure christmas tree installed by Magnolia Petroleum Co., largest operator in the field. Bottom: Tank batteries at Pegasus, brightest objects in the flat, desert-like terrain.

XUM

EUROPE

Price Concession

British Government permits companies ¾-pence increase in price of gasoline; action follows 9-pence tax boost

Dahl M. Duff

THE British Government last week allowed a slight increase in the controlled price of motor fuel. This step was taken 5 days after the freeing of gasoline from rationing restrictions which had been in effect since 1939.

The price increase amounted to ¾ pence per Imperial gallon. This relatively small increase for the companies follows a 9-pence rise in the motor-fuel tax which the government placed in effect late in April.

Discussions between the Government and the companies over a price increase have been going on since before last fall's devaluation of the pound sterling. The companies had sought a 3-penny rise in the price.

The ¾-pence increase is equivalent to about 0.9 cent per Imperial gallon. The London price now stands at the equivalent of about 36.7 cents per U. S. gallon. Of this amount, about 21.5 cents is tax. The present 3-shilling ¾-pence price includes 1 shilling 6 pence tax.

The price increase presumably was a part of the over-all arrangement with the companies for the ending of rationing. This was made possible when the British Government accepted a proposal of Standard Oil Co. (N. J.) to supply its approximately 25 per cent share of the additional market resulting from derationing for payment in sterling. California-Texas Oil Co., Ltd., through its half interest in Regent Oil Co., Ltd., agreed to the plan. Caltex is the other major American supplier and through Regent has about 15 per cent of the market.

Other countries.—New Zealand last week followed the United Kingdom in lifting motor-fuel controls, and derationing was similarly expected in India in the near future. The other major sterling area country, Australia, freed gasoline from rationing in February.

Britain's sudden decision to deration motor fuel was expected to have a generally wholesome effect in the lifting of the few remaining wartime rationing controls left in Europe. France and Italy derationed last year, and Holland and Belgium in 1946. Unrelated to the British derationing was the announcement last week in Copenhagen that kerosine along with solid fuels would be removed from the rationing list June 1.

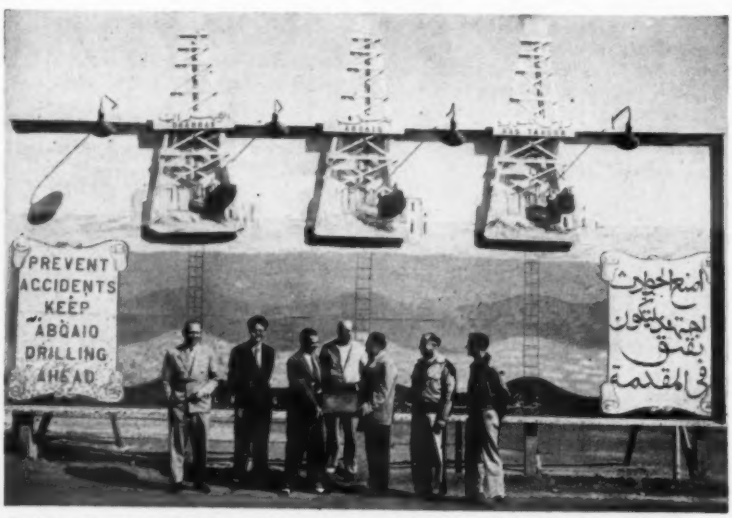
Over-all aspects.—The full implications of the British development on the general sterling-dollar oil problem were still being studied last week. Under the arrangement, a sterling payment for their share of the increased gasoline market will be accepted by the American companies.

This may be used for the purchase of goods and materials inside the sterling area for use outside that area. The matter of sterling payment and suitable currency arrangements for the 90 per cent, more or less, of the market existing before derationing is still under negotiation.

London reports indicated last week that the sterling received by Jersey Standard probably will be used largely on the construction of tankers in the United Kingdom. As far as this company is concerned, the sterling-payment argreement to meet the additional consumption from derationing is effective to the end of 1951. By that time, Jersey's 110,000-bbl. daily Fawley refinery near Southampton is expected to be in operation manufacturing products from purchased Iranian sterling crude oil.

The sterling to be received by the company during this year and a half period is expected to be equivalent to around $7,000,000. This assumes roughly a 10 per cent increase in the existing 5,000,000-ton a year motor-fuel market, with Jersey Standard taking some 25 per cent. Figuring a $4.50 c.i.f. price for motor fuel and 8 bbl. to a ton, this works out to about $7,000,000.

Settlement hopes.—In London, officials of the British Ministry of Fuel and Power said discussions with the American companies and the United States Government on the general sterling-dollar oil policy were still in progress. They said that the two agreements leading to derationing had greatly aided the intergovernment negotiations. In this country there were reports that State Department officials had questioned the ef-



Arabian American Oil Co., which carries out an intensive safety campaign among employes representing nine different nationalities, uses displays such as this to dramatize the program. The derricks represent the company's three districts with the position of the drilling bit showing the accident record. In front are a group at the presentation of a safety award to the Abqaiq district. They are: R. L. Cundall, assistant general manager; Charles Homewood, chief safety engineer; T. V. Stapleton, general manager; W. T. Heberling, Abqaiq district safety engineer; C. F. Bevan, Abqaiq district manager; A. L. Anderson, personnel manager; and P. W. Pederson, assistant Abqaiq safety engineer. More than 12,000 of those among whom Aramco carries on its safety work are Saudi Arabs. Techniques used include contests, posters, publications, slogans, and lectures. Last year the company established a frequency rate of 11.1 disabling injuries per million man hours. This was a sharp drop from the rate of 27.3 in 1948.

fect of the new agreements on the over-all situation.

In connection with the general efforts of the American companies to move away from a dollar-trading basis, it was learned that partial payment in local currencies has been accepted in some recent oil sales. Caltex is reported to have taken a sizable part of some recent sales in francs.

A Caltex official said that the company's requirements of various local currencies were considerable in view of its refinery construction and other expansion in several European countries. He said there was no suggestion that the company was going on a soft-currency basis but that a portion in local currencies would be taken as it was needed and could be utilized.

Part of the payment for crude for the new Dutch refinery of Caltex is in guilders, and the company may make sales in the future for certain amounts of lira, peseta, and guilders.

The agreement between the British Government and Standard-Vacuum Oil Co. has been confirmed by ministry officials in London. This provides that the company will receive increasing amounts of sterling with reduced dollar payments, in stages of 2 or 3 years.

"Any other oil company that could comply with the same conditions would be entitled to the same treatment, but the position of this concern (Standard-Vacuum) is unusual, and it is too early to say whether any other agreements of this type can be reached," the ministry said.

Other developments. — There were several other aspects to the latest sterling-dollar oil developments that attracted attention. Among them were these:

In London, the market in oil stocks were up considerably as a result of the derationing move. Investors also bid for shares of companies dealing in used automobiles.

One English newspaper carried a headline, "Mr. Page Fixed It for You," and referred to Howard W. Page, Jersey Standard's resident representative in Britain, as the official who put the derationing plan up to the government and made the lifting of the controls possible.

An announcement last week of Imperial Oil, Ltd., a Jersey Standard affiliate, mentioned that pipe for its new 75-mile Winnipeg-Gretna pipe line in Canada had been ordered in Britain. This purchase apparently represents utilization of sterling acquired under the new agreement with the British Government.

New British "Offer"

WASHINGTON.—Britain's reply to proposals advanced some weeks ago by the State Department to settle the dollar-sterling oil controversy reportedly was on its way to Washington this week. The indications, however, were that it will prove no more satisfactory to the United States than have previous "offers" of the London Government.

The British note was transmitted through Harry Labouisse, director of the State Department's Office of British Commonwealth and North European Affairs, and the assumption in Washington that no great concessions were to be proffered was based in part on the fact that it was sent over this way instead of being presented with more formality direct to the department. Labouisse was in London on other business and had not previously been deeply associated with the oil controversy.

Meanwhile, although officials here have not formally discussed the deal which the British Government announced last month under which the American companies will sell for sterling, they are represented as resentful of the way in which London apparently attempted to bypass the State Department and arrange matters directly with the companies. Company officials also were reportedly provoked with the manner in which the deal was presented to the public by British officials as a "solution" of the whole dollar-sterling problem.

Zisterdorf Complaint

WASHINGTON. — New complaints of Russian operations in the oil fields in that sector of Austria which it controls were voiced here last week by Austrian consular officials.

In a review of current developments in Austria, it was charged that as a result of last year's production decline in the Zisterdorf oil fields, the Soviet petroleum administration has ordered a series of new drillings and is increasing the number of drilling rigs in the area from 7 to 35.

It was also reported that the Russians have begun sinking wells at the Burenner Road, in the Wolkersdorf Woods area, and near Duernkrut.

Last year's decline in production was partly the result of a shortage of trained personnel, it was said, and the Soviet petroleum officials have since been conducting an intense recruiting campaign to obtain qualified workers and engineers.

Austria oil circles, it was reported, are of the opinion that the Russians are trying to meet the record output of 1,200,000 tons which the Germans reached in 1944, and, since drilling in the Burgenland has so far yielded only gas, are believed to be concentrating their main efforts in the Zisterdorf area.

Approximately half of the estimated 920,000 tons of oil produced in the Zisterdorf fields last year was exported by the Russians, and Austria did not receive a cent from these exports, valued at about $28,000,000, it was asserted.

Emsland Test Successful

Another successful exploratory operation has been reported in the Emsland region of Western Germany near the Dutch border.

Well 8 Lingen-Dalum found oil in an area previously considered unproductive. Through a 10-mm. choke, the well flowed at about 380 bbl. daily, and later on 6-mm. choke, about 200 bbl daily.

The new producer is about a half mile east of Dalum field, itself. In the western part of the field, good production was obtained in wells L 63 and L 73, the first showing for about 125 bbl. daily.

Hamburg reports are that construction has been initiated by the recently formed Emsland-Erdoelleitung, GmbH (Emsland Oil Pipeline Co.) of several lines from the Emsland fields to the nearest railway loading station, Osterwald. Oil has been transported to the station by tank wagons.

Another development in the German petroleum industry of particular interest was that Deutsche Vacuum Oil, A.G. (Socony-Vacuum) has re-

NEXT WEEK

Exploration problems in Canada.—On-the-spot Journal report describing unique problems encountered by geophysical parties in the Canadian bush country.

Gas-injection project.—Engineering article covering the Temblor Zone reservoir at California's Kettleman North Dome field.

Shell Haven refinery.—Construction report on new English refinery; over 2,200 men are working on this installation.

Petrochemicals.—Dr. Gustav Egloff, Universal Oil Products, discusses the petrochemical industry as it now stands and predicts its future growth. The article title is "Petrochemicals—For the Years 1950 and 2000."

Improvements for drilling rigs.—Specially fabricated unitized steel walkways are used by Standard Oil Co. of California to provide safety and convenience.

Reducing vaporization losses.—Engineering treatise by Prof. R. L. Huntington, School of Chemical Engineering, University of Oklahoma.

South Fullerton gasoline plant.—New West Texas gasoline plant detailed by J. M. Hillsman and E. W. Kilgren, Stanolind Oil & Gas Co.

XUM

cently concluded the first considerable barter deal in crude since the war. In exchange for additional exports, it was reported one cargo of crude (about 15,000 tons valued at $350,000) would be imported into Germany from Saudi Arabia.

Barter arrangements for oil have been frequently discussed as one solution for American companies having difficulty in marketing oil in dollar-short areas, especially in the Eastern Hemisphere.

Report on Russia

Writing in Chemische Industrie, Dr. Peter Heinz Seraphim and Dr. Alfond Metzner, European scientists, have made an attempt to shed some light on Russian chemical industry, including production of petroleum and synthetic rubber.

From their deductions it appears that Russia now ranks second to the United States as a producer of synthetic rubber. Total production of synthetic rubber for 1950, they say, is slated at nearly 250,000 metric tons (25,000 tons via ethylene, 75,000 tons from carbide and the rest from ethyl alcohol).

The carbide process is said to have been adopted from the du Pont method and is used in a large factory in Jerewan (Caucasian Armenia) which produces annually 60,000 to 70,000 tons of calcium carbide. Another plant in Kirowakhan also in the same region is credited with a yearly output of 20,000 tons of carbide.

Since the war, oil production has declined greatly through war damage and natural depletion of supplies. Of Russia's total crude-oil production, estimated by the authors at 30.6 million tons in 1948, the Caucasus contributed around 20 million tons. They believe that Baku is likely to retain its top position in Soviet petroleum production picture for many years to come.

Plans have been made for the manufacture of petrochemicals and general organic synthetics, such as solvents, intermediates, detergents, rubber, and ethylene derivatives, etc. Pressure polymerization of butadiene has been in operation in Baku for 10 years at the Saumgait establishment and is to be further developed.

ASIA

Pakistan Invites Companies

WASHINGTON.—Pakistan officials are seeking United States company participation in the development of the oil resources of the Patharias Forest area and are also looking for a company to construct a refinery on a short-term lease basis.

A report to Washington from the embassy at Karachi said the Pakistan Government wishes to open the area to exploration and development.

Oil was discovered in 1933 by Burmah Oil Co., but the discovery well was capped and the field was not developed. The company's exploration license, secured in 1917 and under which it operated until recently, no longer restricts the entry of other oil firms into the area, it was said. An engineer of the Burma company has estimated that the production potential of the field might reach 10,000 bbl. daily.

MIDDLE EAST

Employe Swap

Kuwait Oil Co., Ltd., is continuing a personnel retrenchment program with the replacement of dollar-paid American employes by other nationalities.

A recent U. S. Government report on conditions in the sheikhdom said that the policy of replacing Americans by British, British by Indians, and Indians by the newly trained Kuwaiti appears to be proceeding according to plan and is expected to gain momentum.

American population of Kuwait was recently estimated at 250 persons, 154 employed by the oil companies and the remainder comprising dependents. This compares with 600 to 700 Americans present last year. The Kuwait company's labor force has been reduced from 17,000 to about 10,000 and may decline to 4,300 by the end of this year.

Much of this reduction was due to the completion of several major projects in Kuwait, including docks and loading facilities and a fuel-oil refinery. Also, in the case of American employes, the company presumably is seeking to reduce the dollar component of its costs as far as possible.

FIRST TIME IN JAPAN.—The men in this picture are performing the first three-stage cementing operation ever conducted in Japan. The job was done on a gas well drilled for Niigata Gas Development Co. near Niigata City. The operation was completed in 3 hours over-all time. Locally designed stage tools were used. The first batch of cement, 140 sacks, was placed from 430 to 300 m.; the second stage, 160 sacks, from 300 to 150 m.; and the third stage, 160 sacks, from 150 m. to the surface.

LATIN AMERICA

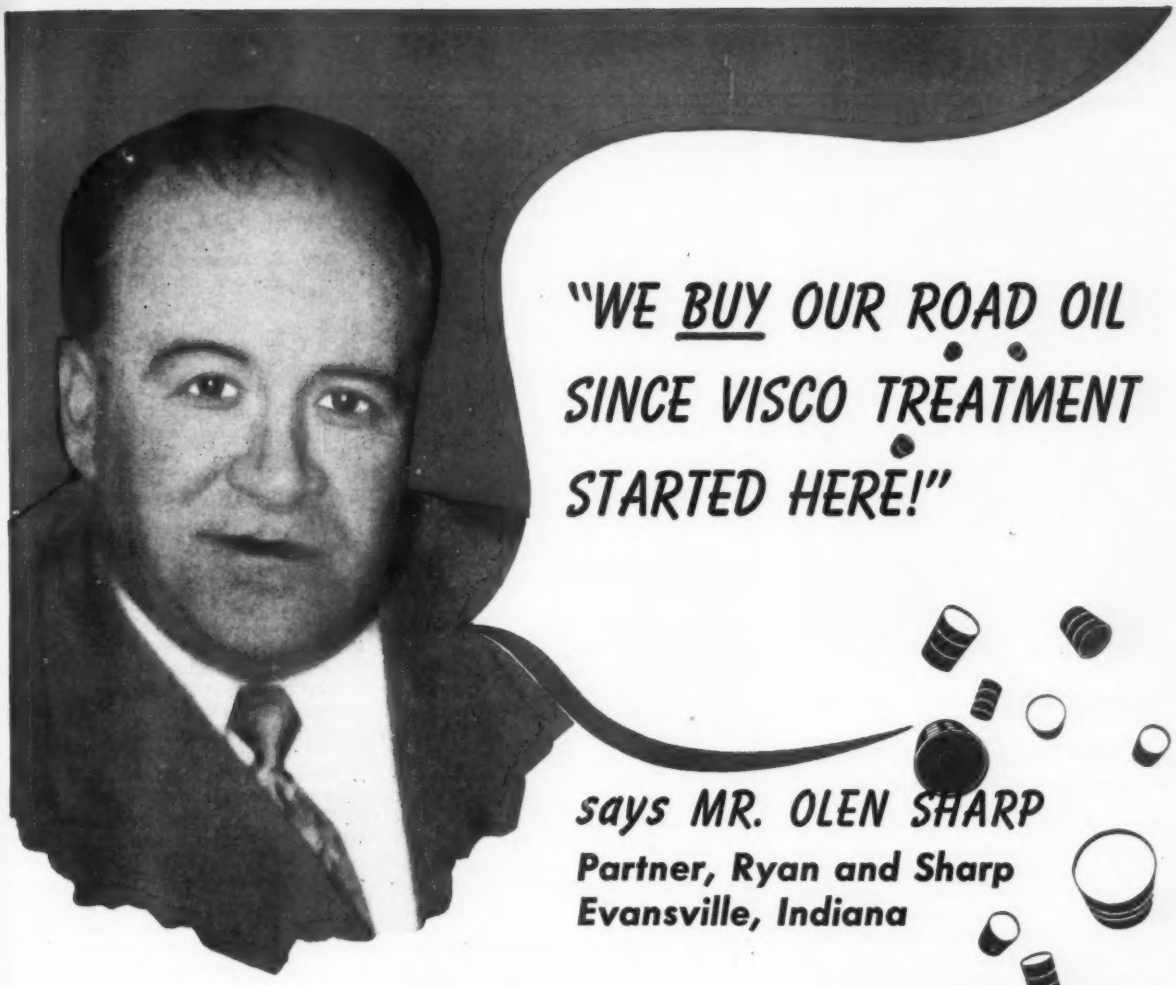
2 Tetuan Completed

Texas Petroleum Co., now the most active operator in exploration work in Colombia, has completed its second Tetuan producer and spudded in a new wildcat on the Caribbean Coast.

The No. 2 Tetuan well confirms the first well as a field discovery in this Upper Magdalena Valley area northwest of Ortega. Reports were that 2 Tetuan showed for 1,000 bbl. daily of low-gravity oil.

The company is now rigging up for 3 Tetuan. The discovery was completed in February at 4,579 ft. total depth at Colombia's first wildcat discovery in more than 3 years. The second well went to 2,767 ft. total depth. The first well was located about 13 miles northwest of Ortega, and Texaco is now preparing for another wildcat test about 3½ miles north of that town.

Drilling at the Salamanca well on a sandspit about 13 miles east of Barranquilla on the Caribbean Coast was commenced recently. It is located on the Pivija Fundacion concession.



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XUM

Steps Up

Fisher is coordinator of Jersey Standard refineries

H W. FISHER, Cranford, N. J., deputy coordinator of refining operations for Standard Oil Co. (N. J.), has been elected coordinator succeeding William J. Haley, who has been named president of Esso Export Corp.

Fisher's entire business career has been with the Jersey organization. After graduation from Massachusetts Institute of Technology as a chemical engineer in 1927, he joined Esso Standard Oil Co. as a member of the newly created technical group working on hydrogenation in the company's Baton Rouge research laboratories. He was later transferred to the Esso laboratories at the Bayway refinery, Linden, N. J.

In 1933 Fisher was appointed assistant manager of the engineering division, sales department, Esso Standard, and in 1935 became assistant director of the Esso laboratories at Bayway, where he supervised development and research work on fuels, lubricants, and chemicals.

Appointed manager of Esso's chemical-products division in 1936, Fisher in 1945 was elected a director of Esso Standard. Two years later he was named president of Enjay Co., Inc., subsidiary of Jersey Standard.

In 1948 he was appointed Esso Standard's manager of East Coast refineries and in 1949 was appointed deputy coordinator of refining activities. He is a native of Rutland, Vt.

William J. Haley, coordinator of refining operations, Standard Oil Co. (N. J.), has been elected president of Esso Export Corp., succeeding **Frank M. Balling,** who will remain as a director pending his retirement in the near future. **Harold W. Fisher,** deputy coordinator, succeeds Haley as coordinator. Haley, a native of Philadelphia, joined Jersey Standard 36 years ago following graduation as mechanical engineer from the University of Pennsylvania. He has served in various executive capacities at refineries of Esso Standard Oil Co. and Latin American affiliates and has been coordinator of refining activities for Jersey Standard since 1947. Balling, with the company 45 years, was elected vice president of Standard Oil Export Corp., predecessor of Esso Export Corp. in 1929. He was named president of the newly created Esso Export firm in 1944.

R. W. Rice has been elected chairman, and **E. C. Oden** has been named chairman-elect of the Southwest Louisiana Section, American Chemical Society. Other officers include: **J. A. Wood,** Cit-Con Corp., Lake Charles, secretary; **C. A. Burns,** Mathieson Chemical Corp., treasurer; and **R. E. Price,** Crosby Chemical Corp., De-Ridder, La., councilor. Rice is with Firestone Tire & Rubber Co., and Oden is chief process engineer for Cities Service Refining Corp., at Lake Charles.

Harold Vagtborg, Stouthwest Research Institute, San Antonio, has accepted the Missouri Valley College's award of a Doctor of Laws degree in recognition of his record of service "in the field of vital research."

E. Wayne Hoylman has resigned as chief geologist of Fairchild Aerial Surveys, Inc., Los Angeles, and has established offices in Los Angeles as a consulting geophysicist, specializing in interpretation of airborne magnetics. He formerly was associated with Gulf Research & Development Co. and participated in development of that company's airborne-magnetometer operations.

Donald P. Jones, controller for Sun Oil Co., has been elected director of the Philadelphia Control, Controllers Institute of America.

Lewis C. Hullinger, chemical engineer, research department, Standard Oil Co. (Ind.), Whiting, last week became the 10,000th member of the American Institute of Chemical Engineers.

David Duke Cochrane has been elected a vice president of Godfrey L. Cabot, Inc., Boston carbon-black manufacturing firm. He has been been with the firm since 1932.

R. B. Gilmore, with DeGolyer & MacNaughton, Dallas, has been elected president of the newly organized Engineers Club of Dallas.

Roy F. Bennett, Sohio Petroleum Co., has been elected president of the Houston Section, Society of Exploration Geophysicists, succeeding **Jack C. Pollard** of Robert H. Ray Co. Other new officers include: **J. B. Ferguson,** Petroleum Surveys, Inc., and **W. C. Kimball,** Apache Exploration Co., vice presidents; **Eugene W. Frowe,** Robert H. Ray Co., secretary; and **J. E. McGee,** Gulf Research & Development Co., treasurer.

Charles P. Brocato, Tide Water Associated Oil Co., Houston, has been transferred to Corpus Christi as district geologist. Other changes include: **Wynne M. Adams,** assistant geologist at Tyler, Tex., transferred in the same capacity to Houston; **Louis H. Davis,** named scout at Jackson, Miss.; and **Martin A. Zeidner,** named assistant geologist at Jackson.

James E. Fox, Jr., proration engineer at Fort Worth for Stanolind Oil & Gas Co., is now serving as field engineer at Brownfield, Tex.

Jack W. Hudson, district superintendent of Republic Natural Gas Co. at Pauls Valley, Okla., is now located in Dallas as superintendent of the company's oil and gas divisions.

***WINNING SUGGESTION.**—L. C. Culpepper, head roustabout for Carter Oil Co. at Magnolia, Ark., receives congratulations from O. C. Sharp, Carter president, right, on winning a first-place certificate, gold medal, and $500 for a business-improvement suggestion which was adjudged best among 16,000 screened in 1949 from employes of Standard Oil Co. (N. J.) and affiliates. His suggestion was a method for improving a step in salt-water-disposal operations. A. J. Schlehofer, assistant pumper at Carter's refinery at Billings, Mont., won the second price of $300 for a steaming-out device for tank cars.*

Rogers W. Johnson, engineer at New Orleans for Shell Oil Co., has been transferred to Lake Charles, La., as exploitation engineer.

R. G. Bechtel, T. L. Regan, and **K. W. Bolt,** division superintendents for Stanolind Oil & Gas Co., have been transferred. Bechtel, formerly at Houston, has been moved to Casper, Wyo., as superintendent of the Rocky Mountain division; Regan, formerly at Oklahoma City, will fill Bechtel's place in Houston; and Bolt has been named to fill Regan's post at Oklahoma City.

Warren Beebe, exploration manager for Anderson-Prichard Oil Corp., Oklahoma City, has resigned and will enter the independent field.

G. H. Fisher, formerly chief petroleum engineer for Gulf Oil Corp., Fort Worth, has been appointed manager of supply and service. In addition, he will act as executive assistant to the vice president. **F. E. Hatfield,** formerly superintendent of production, has been named manager of exploitation, and **H. M. Bayer,** formerly chief geologist, has been made manager of exploration.

Burrell G. Taylor, mud engineer at Orange, Tex., for Kerr-McGee Oil Industries, Inc., has been named engineer at Sunray, Tex.

Richard R. Roberts, Vickers Petroleum Co., has been elected president of the Oklahoma City Geological Society. Other officers are: **Joe M. Sears,** consultant, vice president; **Murrell D. Thomas,** Eason Oil Co., secretary; and **D. Osborne Prescott,** Shell Oil Co., treasurer.

CHARTER MEMBER.—Robert F. Six, right, president of Continental Air Lines, and an independent Rocky Mountain oil producer, receives the last charter membership in the Denver Petroleum Club from G. F. McMillan, Gulf Oil Corp., president of the club. Six's membership was the 300th, which fills the club's roster.

Thomas R. Shugart, consultant, has been elected president of the Dallas Geophysical Society. Others elected include: **J. P. Woods,** Atlantic Refining Co., and **W. R. Mitchell,** National Geophysical Co., vice presidents; and **F. H. Kennedy,** Geotechnical Corp., secretary-treasurer.

Homer D. Austin, engineer at Coffeyville, Kans., for Schermerhorn Oil Corp., has been moved to Lenapah, Okla., in the same capacity.

DARRELL SMITH

Darrell Smith, Alice, Tex., has been named district superintendent of The Texas Co.'s southwest district, South Texas division, succeeding **E. C. Middleton,** who has retired. Smith joined the firm 11 years ago and has served as engineer, drilling foreman, and assistant district superintendent. He is a graduate petroleum engineer from Texas A. & M. College.

J. M. Hansell, division geologist for Sun Oil Co. at Calgary, Alta., Canada, has been transferred in the same capacity to Denver.

Harry C. Weeks, of the firm Weeks, Bird, Cannon & Appleman, Fort Worth, has been elected president of Old Ocean Oil Co., and J. S. Abercrombie Co., Houston. **Arthur Johnson,** Denver, and **F. J. Schempf,** Houston, have been elected new members of the board of directors. Other changes include: **C. Wayne Shively,** chief engineer, named assistant to the vice president; **Charles R. Burney,** production superintendent, Old Ocean field, named to succeed Shively; and **T. W. Lytle,** appointed to succeed Burney.

J. J. Albrecht, The California Co., Lake St. John, has been transferred to Natchez, Miss., as division gas engineer. Other changes include: **W. H. Ashby,** Brookhaven, Miss., and **Harry Dupre,** Harvey, La., named to engineering staff at New Orleans; **M. W. Grant,** operating superintendent, Casper, Wyo., named acting field superintendent for the Rangely, Colo., area; **T. H. Jackson, Jr.,** engineering staff, New Orleans, named field superintendent at Cranfield, Miss.; and **I. W. Willard,** assistant division operating superintendent, named superintendent at Natchez, Miss.

Charles J. Deegan, associate editor of The Oil and Gas Journal, Tulsa, has resigned to join the firm of Cummins, Berger & Pishny, consulting geologists and engineers in Fort Worth. Deegan was with the Petroleum Administration for War in Washington, D. C., prior to joining the Journal. Formerly he worked with both the old Marland Oil Co. and Continental Oil Co. He is a member of the American Association of Petroleum Geologists, Society of Exploration Geophysicists, and American Institute of Mining and Metallurgical Engineers.

W. J. Grissett, C. M. Satterfield, and **Cliff I. Newbrough,** all of Texon, Tex., and employes of Big Lake Oil Co. since its organization in 1923, have been promoted following the retirement of **Charles E. Beyer** on June 1. Beyer's retirement as vice president and general manager has ended 36 years of service with the Benedum-Trees oil interests. He plans to make his new home in Fort Worth. Grissett, formerly general superintendent, has succeeded Beyer as general manager. He joined the company in September 1924, as a pipe liner, was named tool pusher in 1936, assistant superintendent in 1938. He was made general superintendent in 1947. Satterfield started to work for Big Lake in June 1924 as pumper. He was made farm boss in 1939 and held that position until raised to general superintendent, succeeding Grissett. Newbrough joined the organization in 1925 as gager. He was gang pusher from 1941 until his promotion to farm boss, succeeding Satterfield.

H. M. Morse has been reappointed executive supervisor and secretary of the Mississippi State Oil and Gas Board for another year. He has held this position since 1938.

Thomas A. Hendricks, senior geologist for Stanolind Oil & Gas Co., Tulsa, has been named to the new post of district exploration superintendent for the West Texas-New Mexico district, with headquarters in Midland, Tex. He has been with the company since 1948, and formerly was with the U. S. Geological Survey.

William F. Davis, assistant to the northern division general superintendent, Interstate Oil Pipe Line Co., Tulsa, has been loaned to Lakehead Pipe Line Co., Inc., as assistant manager. Davis joined Carter Oil Co. in

XUM

PERSONALS

1937 and in 1942 joined Oklahoma Pipe Line Co., Interstate's predecessor, as district engineer at St. Elmo, Ill.

R. S. BLAZER

Rexford S. Blazer, president of Allied Oil Co., Inc., Cleveland, has been named president of Frontier Oil Refining Corp., Buffalo. He succeeds **William H. Bennett,** who was recently named chairman of the firm's executive committee. Blazer will continue as president of Allied Oil.

H. L. Williams, resident engineer at St. Francisville, La., for Transcontinental Gas Pipe Line Corp., has been transferred to El Campo, Tex., as progress engineer.

Joseph H. Turner, district geologist for Phillips Petroleum Co. at Denver, has been named division geologist at Bartlesville, Okla., with supervision of the Denver and Salt Lake City districts, including western New Mexico and the Dakotas. **Claude Peavy,** district production manager at Salt Lake City, is transferring to Denver, along with **Hugo Reicken,** production engineer, and **C. C. Kirkland,** chief clerk.

Bruce K. Brown, president, Pan-Am Southern Corp.; **J. W. Bertetti,** manager of the company's El Dorado, Ark., refinery; **George G. Moore,** manager of production and pipe lines at El Dorado; and **Milton C. Hoffman,** vice president in charge of exploration and production at Shreveport, headed a group of executive and supervisors which met in Alexandria, La., recently for a 2-day conference on company operations.

M. W. Kibre, formerly assistant manager of General Petroleum Corp.'s natural-gas department, Los Angeles, has been appointed manager to succeed **H. L. Eggleston,** who retired June 1. Kibre has been with General Petroleum since 1929, becoming gas superintendent in 1942, general superintendent in 1944, and assistant manager in 1946. Eggleston, a pioneer of the West Coast gas and natural-gasoline industries, joined Standard Oil Co. of California in 1915. He joined General Petroleum in 1945 as manager of the gas department when the company absorbed Gilmore Oil Co.

C. C. Hutchens has resigned as district geologist at Evansville, Ind., for Rock Island Refining Co., and will enter the independent field.

Lee E. McDuff, division engineer for Transcontinental Gas Pipe Line Corp. at St. Francisville and Opelousas, La., has been transferred to Laurel, Miss., as maintenance engineer.

H. E. Schwartz, Jr., district petroleum engineer in Magnolia's Brownfield, Tex., producing district, has been transferred to the Chase, Kans., district to serve as district petroleum engineer. Headquarters will be Great Bend, Kans. **J. P. Schmalz** has been appointed district petroleum engineer at Brownfield, succeeding Schwartz. He was formerly district petroleum engineer for Magnolia at Rodessa and for the past 9 months has been on leave of absence studying at the University of Oklahoma under a Magnolia fellowship. **Robert E. Ritchie,** petroleum engineer, has been transferred from Great Bend to the Kermit district in West Texas. **James F. Mayfield,** petroleum engineer in the Rodessa district, has been promoted to district petroleum engineer, and **Hudie H. Barber** has been promoted to assistant foreman in the Jackson, Miss., producing district.

T. T. Nudson, drilling superintendent at Upton, Wyo., for Pacific Western Oil Corp., has been transferred to Thermopolis, Wyo., in the same capacity.

E. C. Borg has been appointed purchasing agent for the Pacific Coast division, The Texas Co., succeeding **J. T. Rankin,** who is retiring after 42 years of company service. Borg has been with the company since 1929.

Carl S. Kuhn, Jr., Magnolia Petroleum Co., has been named assistant supervisor in the production-research division, field - research laboratory. **Evin L. Cook** succeeds him as activity leader for muds and cements. Kuhn has been with the company since 1937 and is a graduate of Carnegie University. Cook joined the company in 1949 and is a graduate of Baylor University.

R. H. Gwinner, former senior exploitation engineer with Shell Oil Corp., and later petroleum engineer for Sunray Oil Corp., has joined the oil-loan division of the First National Bank & Trust Co. of Tulsa.

Dr. Robert E. Marschner, Standard Oil Co. (Ind.), has been elected chairman of the Chicago section, American Chemical Society.

Dr. Heinz Krekeler, German petroleum chemist, has been approved by the U. S. Government as the first postwar German consul in the United States, and has accepted the position. From 1934 until the end of World War II Dr. Krekeler worked for I. G. Farbenindustrie. He is expected to arrive in New York City in August.

Moreland T. Hartwell, consulting geologist, has moved from Artesia, N. M., to Midland, Tex.

Charlie Gordon, Dallas, is president of the newly formed Charlie Gordon Oil Co., Inc., Owensboro, Ky. Other officers are: **Fred W. Rose,** vice president and secretary-treasurer; and **F. H. Rhodes,** vice president in charge of field operations.

R. G. Peeler, Stanolind Oil & Gas Co., has been elevated from assistant field superintendent to field superintendent and transferred to the company's newly established area office in Henderson, Tex.

Vic Climer, superintendent for **Sam Garfield,** independent operator, has transferred from Olney, Ill., to Evansville, Ind., in the same capacity.

J. B. Maebius, Saginaw, Mich., has been named district geologist for Gulf Oil Corp. at Casper, Wyo.

Max David, consulting geologist and independent oil operator, has been elected president of the Midland, Tex., Geological Society, succeeding **L. E. Patterson,** district geologist for Cities Service Oil Co. Other officers include: **William S. Blackman,** Lion Oil Co., vice president, replacing **Allen Ehlers,** district geologist for Skelly Oil Co.; **Paul H. Kolm,** secretary-treasurer, succeeding **James R. Cotton,** Pure Oil Co.; and **John E. Galley,** Shell Oil Co., program chairman.

DEATHS

Edward F. Everett, 35, chemical engineer with Houdry Process Corp., died in Philadelphia May 24.

Tobias J. Livingston, 60, retired pipe-shop foreman for Mid-Continent Petroleum Corp., Tulsa, died June 2.

O. F. Hedrick, Midland, Tex., oil operator, died May 27.

J. O. Turner, 43, research chemist and patent attorney for Phillips Petroleum Co., Bartlesville, Okla., died May 28.

Fred J. H. Penney, 60, assistant division superintendent of the receiving and shipping department of the Aruba, N. W. I., refinery of Lago Oil & Transport Co., Ltd., died May 31 at Frankfort, N. Y.

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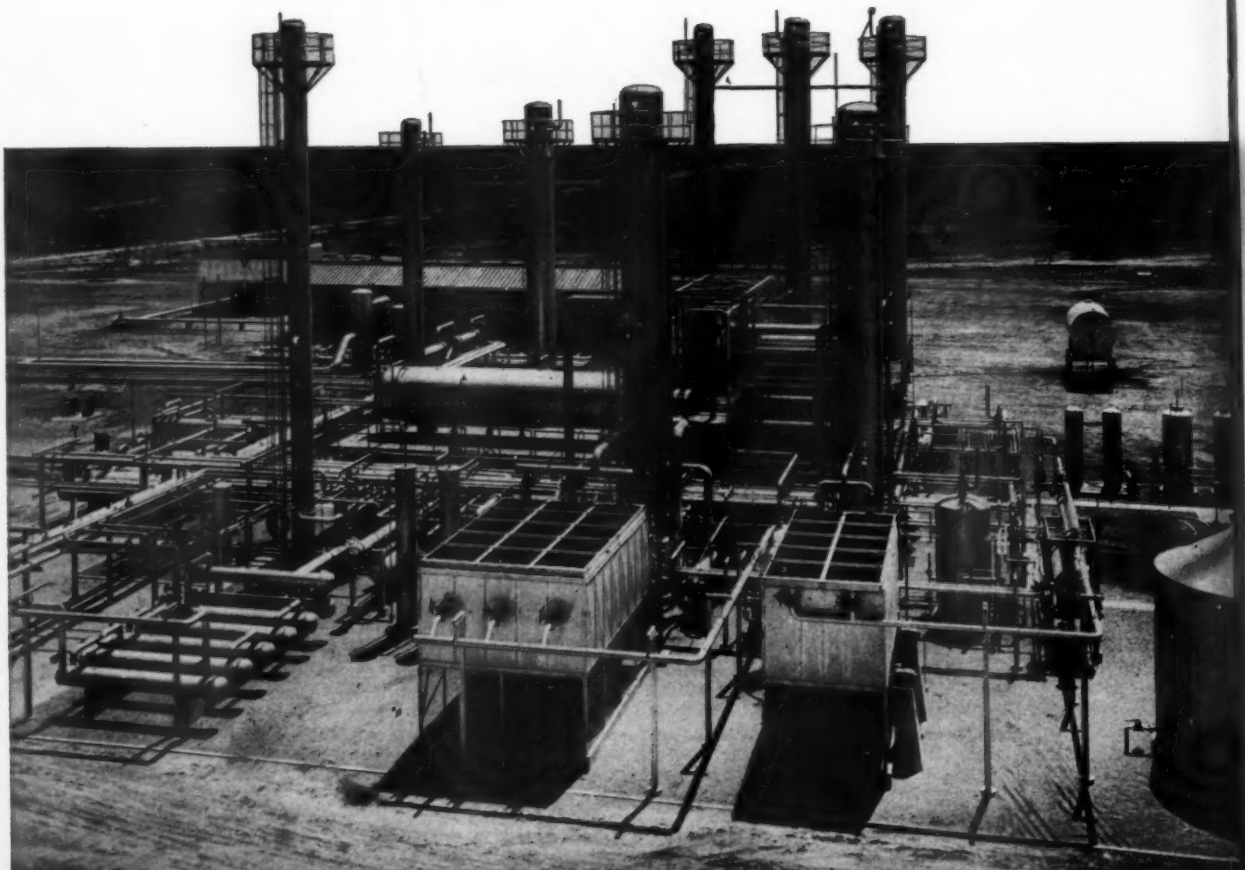

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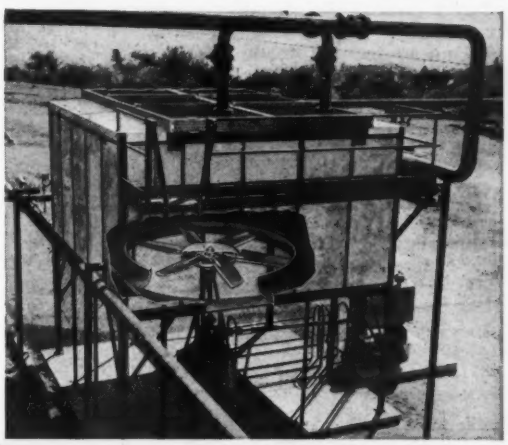

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UNDERGROUND STORAGE OF L.P. GASES . . . *successfully performed at Carthage field plant of The Chicago Corp.*

by Charles B. Johnson, Jr.*

FLUCTUATIONS in the L.P.G. market during the winter of 1947-1948 strongly emphasized the need to hold supply more closely to demand regardless of the range of the latter. Obviously, the solution is storage tanks but the cost of such pressure vessels compared to the prevailing price of the product precludes that route.

Previous attempts to store L.P.G. in underground reservoir had not been too successful but extraction efficiency and the market outlook have provided incentive for further experimentation. A summary including development and operation of one injection-reproduction cycle in underground storage of propane is herein outlined.

A subsurface storage project near the Feazel & Kinsey plant of The Chicago Corp. in Carthage field, Panola County, Texas, was decided on. The objective was to determine if a salable liquid product requiring no reprocessing other than possible drying to meet N.G.A.A. specifications, could be withdrawn or reproduced from the reservoir when needed.

This objective made absolutely necessary the condition that the stored L.P.G. should not come in contact with other hydrocarbons. A reservoir in the Paluxy sand which appeared to contain only salt water was chosen and a four-spot waterflood-type pattern was laid out. Only the injection well and one relief well were completed and utilized the first year. Results were highly successful and the original program is now being completed to accommodate the full anticipated storage volume.

Some of the previous full-scale experimental work on underground storage of L.P.G. was done in South Texas using partially depleted gas-condensate sands. Results varied over a wide range and at best were only partially successful. On back flow it was found the injected product was severely contaminated with methane, ethane, butane, and pentanes and heavier, thereby requiring complete reprocessing.

In the Carthage subsurface storage project reproduction as an uncontaminated salable liquid was a requirement and of course economics were of prime consideration. Experiment and research both include too many intangibles to permit accurate prediction of payout; therefore, it was found necessary to relate prices in order to include the economic aspects. The values could be compared on a unit basis as follows:

Value of propane as vapor sold to gas pipe line = $0.067 per bbl.
Value of propane as liquid (1947-1948 market) = $2.52 per bbl.
Value ratio = 37.6:1.

It was considered that this ratio was subject to sizable fluctuation, mostly in a downward direction, but if the manufacture of L.P.G. was at all worth while, the odds were great enough that the experiment should pay out. Allowance was also made for the fact that the volume injected initially could not be recovered in its entirety. This "cushion volume" could be lost through migration or, due to the irregularity of permeability, might either be trapped from the well bore or present costly production problems to recover.

There were no reservoirs in the Carthage area which were known to meet the requirements, and subsurface detail was lacking on account of the wide spacing pattern in effect. However, electric logs indicated possibilities of porosity in the Lower Cretaceous from about 2,700 to 3,300 ft. The Paluxy sand was selected as the most likely horizon for the purpose and the structure map, Fig. 1, was prepared. This horizon is a blanket sand covering a wide area and includes numerous gas and oil fields in the East and East Central

*Chief engineer, The Chicago Corp., Corpus Christi, Tex. Paper presented at twenty-ninth annual meeting, Natural Gasoline Association of America, Fort Worth, April 24-26.

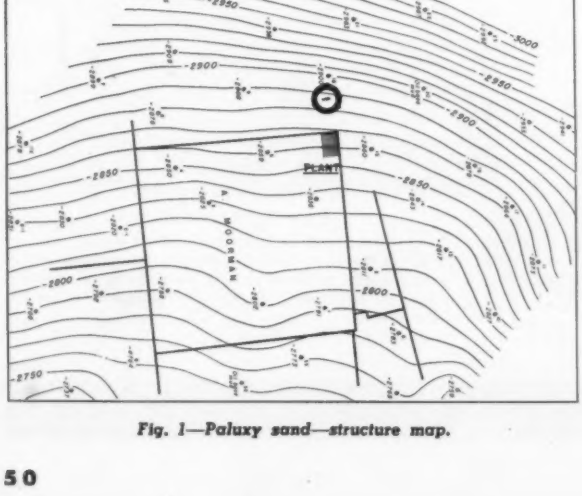

Fig. 1—Paluxy sand—structure map.

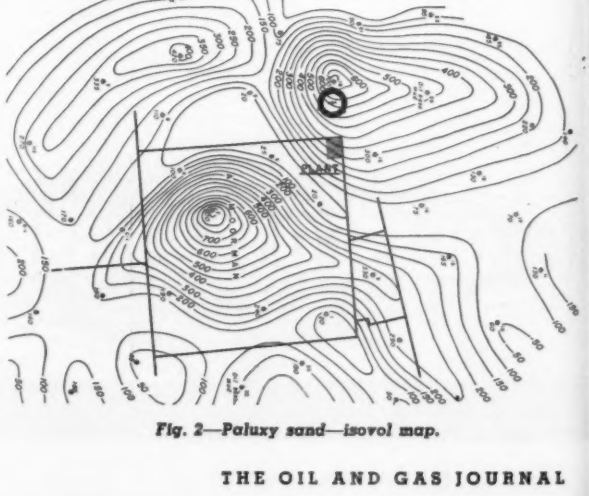

Fig. 2—Paluxy sand—isovol map.

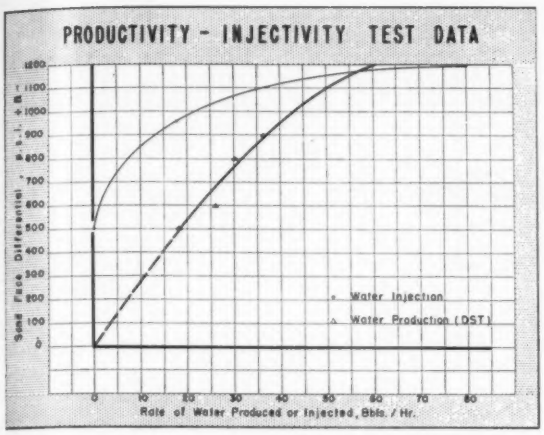
PRODUCTIVITY - INJECTIVITY TEST DATA
Sand Face Differential
Water Injection
Water Production (DST)
Rate of Water Produced or Injected, Bbls. / Hr.

Fig. 3—Chart of test data for productivity-injectivity.

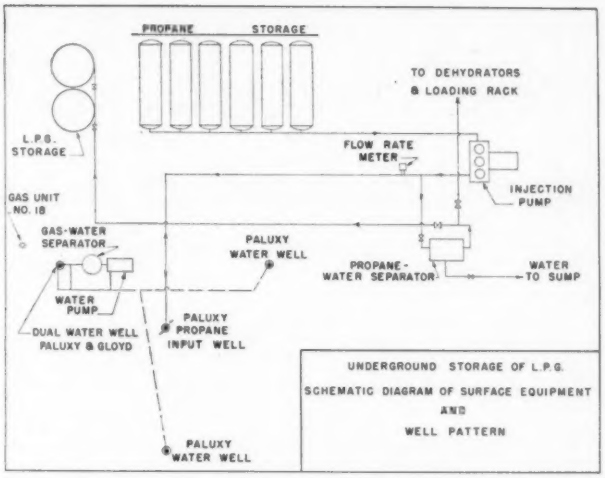

Fig. 4—Schematic diagram of surface equipment and well pattern.

Texas area. Estimated limits of the ultimate propane-water interface are shown by the circle. The structural dip in this vicinity is about 50 ft. per mile but steepens to about 100 ft. per mile in the downdip direction.

To determine the probability of the existence of a trap, an isovol map, Fig. 2, was constructed. Isovols are lines connecting points of equal value as determined from the product of millivolts times feet of thickness read from electric logs and are therefore relative to sand thickness. It is to be noted that the "knoll" with the lower maximum isovol value was selected. This is due to the location of the plant.

Founded on the volume of L.P.G. delivered to gas pipe line during the previous warm season, with adjustment for improved extraction efficiency, estimates showed at least 150,000 bbl. of storage space should be provided. Based on the usual volumetric calculations and allowing for the possibility of an elongated axis, a four-spot system was set up with the injection well at a considered safe distance from the nearest field-gas well. The three outside wells were to serve the triple purpose of interface control, pressure relief, and water flood.

Assuming that an actual trap was available, injection pressures greater than the weight of the overburden might probably be reached, and this pressure should be relieved to prevent loss of material and damage to equipment. Considered also was the idea that the Paluxy sand would vary in thickness as well as in physical characteristics, and therefore possible control of the L.P.G.-water interface might be obtained to some extent by regulation of flow of water from relief wells.

The important factor, rate of reproduction, could be controlled either with mechanical pumping equipment installed in the injection well or by "natural flow" which might need to be aided by water flood, by converting the relief wells into flood wells, to maintain the reservoir pressure.

Cores of the Paluxy section obtained in drilling the injection well were comprised of about 8 ft. of hard shaly sandstone in the upper part and approximately 4 net feet of permeable sandstone in the lower part. Data on these cores are as follows:

Depth (ft.)	Permeability (md.) Vertical	Horizontal	Porosity (%)
3,237.0	140	128	20.6
3,237.5	110	163	....
3,238.0	102	144	18.4
3,238.5	...	188	....
3,239.0	140	353	23.0
3,240.5	...	272	....
3,241.2	...	120	24.8
Average	123	195.4	21.7

This range of permeability to air is recognized as being relatively low for transmission of liquid and an open-hole drill-stem test was made, previous to setting casing, to determine the reservoir productivity. The lower curve, in Fig. 3, is a plot of the drill-stem test results wherein rate of water production in barrels per hour is compared with the difference between bottom-hole flowing pressure and original reservoir pressure of 1,445 psig. at 130° F. Extrapolation of this curve gave sufficient proof that deliverability could be attained with reasonable pressure drawdown.

Casing was set at the top of the sand and the well was completed with tubing set on a packer. After completion, an injectivity test was made by pumping fresh water into the well at various rates. The upper curve, Fig. 3, is a plot of the difference between calculated sandface pressure at various rates and original pressure, versus the rate at which water was injected.

Arrangement of complete layout is shown in Fig. 4. The pump suction is connected to the propane storage tanks and discharges via pipe line to the Paluxy propane-input well. The injection pump is a triplex unit rated at 1,850 psig. working pressure at 70 g.p.m. The "two directional" flow meter is used for rate regulation on both injection and production.

The injection line is used for production on back flow, the liquid going first to the propane-water separator. The liquid-level control bypasses any free water to a sump. Propane from the separator is flowed either to dehydrators, thence to the loading rack, or direct to L.P.G. storage tanks for blending.

The dual water well provides both a propane-water interface control point in the Paluxy sand and a source of water, for flooding purposes, from the Gloyd limestone. Flow from either zone is through a gas-water separator which is installed in series with the pump suction. The remaining two wells are now being drilled and will be connected into the pumping equipment installed at the dual water well. Water produced from these two wells will also be injected into the Gloyd zone.

Injection procedure consisted of drawing directly from surface storage, generally at full pump capacity, with the result that propane was injected in slugs of 500 to 1,500 bbl. Sandface injection pressures were in the range of 2,500 psig. and a measured injectivity index at a rate of 1,160 bbl. per day was 2.5 bbl. per day per psi. increase. By the time some 5,500 bbl. of propane had been injected the reservoir pressure, at stabilized conditions (23 days static), had reached 1,726 psig., which was good evidence of a closed reservoir. Injection was continued until a total of 14,000 bbl. was in storage, at which time a production test was started prior to drilling the first relief well.

A summary of this first production test is shown by Fig. 5. A plot of well-head pressure and rate of production performance with respect to

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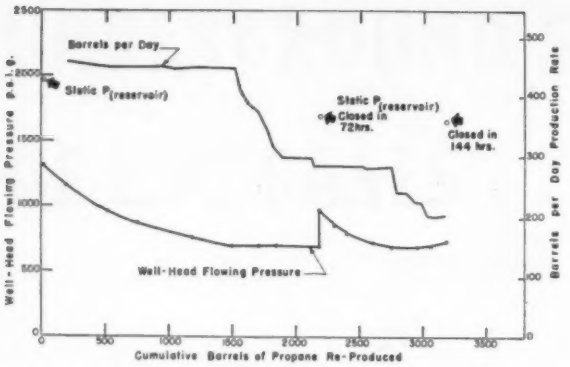
Barrels per Day
Static P (reservoir)
Static P (reservoir) Closed in 72 hrs.
Closed in 144 hrs.
Well-Head Flowing Pressure
Well-Head Flowing Pressure, p.s.i.g.
Barrels per Day Production Rate
Cumulative Barrels of Propane Re-Produced

Fig. 5—Reproduction test data, July 1949.

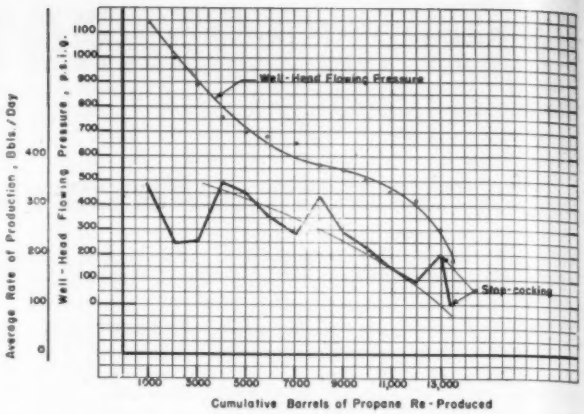

Fig. 6—Propane produced to market, January 1, 1950, to March 9, 1950.

accumulated produced propane. This test showed that the rate of production could be maintained at approximately 500 bbl. per day without causing either sloughing at the sandface or water coning. This volume was produced "water free" except for an apparent small amount of absorbed water which "pinked" a cobalt-bromide test.

When a total of 1,327 bbl. has been back flowed, and while propane was being produced at a rate of 495 bbl. per day, the sandface flowing pressure was measured as 1,375 psig. which, referred to an estimated reservoir pressure of 1,820 psig. at this same time, gives a productivity index of 1.1 bbl. per day per psi. decrease. Well-head pressure was controlled just before reaching 700 psig. in order to retard any tendency of water influx. From this point on the rate of production declined rapidly but tended to stabilize at approximately 330 bbl. per day.

When 2,180 bbl., about 15 per cent of that in storage, had been reproduced the well was closed in for a buildup test, and the static reservoir pressure was found to be 1,706 psig. which was 18 per cent above original pressure.

An additional 1,000 bbl. were reproduced on a succeeding test, for a total net recovery of 22.6 per cent, all of which was produced by "natural flow" and water free except for the absorbed water mentioned previously. The final stabilized reservoir pressure after back flow was 1,684 psig.

Following this series of tests, the first "relief flood" well was drilled and equipped, in the same manner as a regular dually completed well, so that water could be transferred as desired between the Paluxy sand and the Gloyd limestone, which is found at about 5,200 ft. The Paluxy section in this well proved to be relatively poor with an average horizontal permeability to air of 63 and a vertical of 112 md. over an estimated net thickness of 6 ft.

Maximum possible rate of water production was 250 bbl. per day while reinjection greater than 90 bbl. per day could not be attained without approaching pressures in the vicinity of the weight of the overburden. Because of the low injectivity, use of the one "flood well" for increasing reproduction of propane was of no consequence.

Injection of propane was continued until the end of the year at which time the liquid balance in the reservoir was:

	Bbl.
Total propane injected	53,220
Test volume reproduced	3,180
Remaining propane in reservoir	50,040
Water produced through relief well	7,714
Net material added to reservoir	42,326

The latest production history is illustrated in Fig. 6, which shows flowing pressure and barrels per day rate of production, both as a rolling acreage, compared to cumulative barrels of propane reproduced. Performance is similar to the original production test except for the effect of water influx which at the end caused an extreme drop in productivity.

The well was "stopcocked" in an effort to attain flow velocity sufficient to flush out the water, but this venture was unsuccessful. Installation of pumping equipment in the propane injection well would have given additional recovery but the already declining L.P.G. market caused postponement of this procedure. From bottom-hole - pressure-chart gradients and flowing pressure-production relation, indications are that water accumulation in the well bore began to affect the flow rate after the first 7,000 bbl. were recovered. The productivity index, recorded just after reproduction of 10,000 bbl., had declined to 0.87 bbl. per day per psi. pressure drop.

Excepting the short column of water which was found standing in the bottom of the tubing, the well-head flowing pressure is representative of reservoir pressure conditions. The similarity in performance between these data and production from a constant volume type gas reservoir is marked.

Pressure - volume performance for the entire cycle is shown in Fig. 7. This plot compared static reservoir pressure to net material added to the reservoir. These latter data are adjusted for water produced through the relief well. Leveling off of the reservoir pressure at 1,970 psig., regardless of added material, is evidence that liquid is apparently being moved out of the existing trap across a permeability barrier.

Volumetric performance of the first test probably parallels that for the market period. The latest pressure

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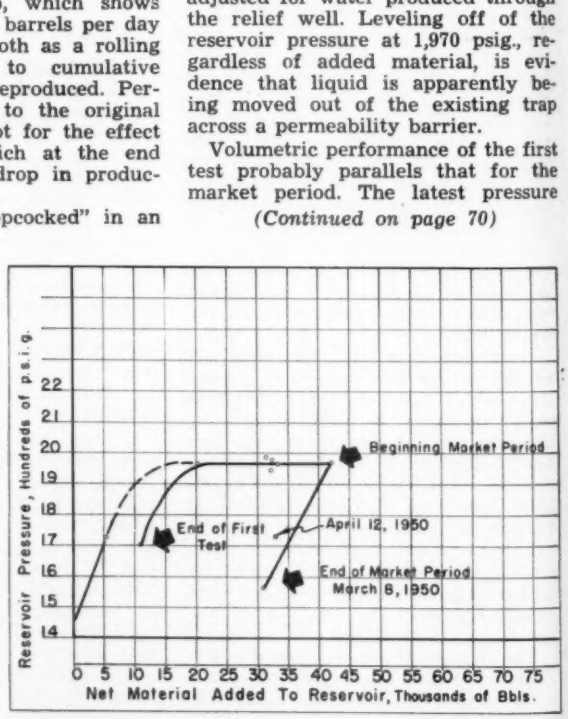

Beginning Market Period
End of First Test
April 12, 1950
End of Market Period March 8, 1950
Reservoir Pressure, Hundreds of p.s.i.g.
Net Material Added To Reservoir, Thousands of Bbls.

Fig. 7—Pressure-volume performance, injection and production.

Magnetic-Particle Inspection—

Applications in the Petroleum Industry

by W. E. Thomas*

THE petroleum industry is heavy industry. Its equipment for drilling, producing, transporting, and refining is some of the heaviest equipment used in any industry in the country. Much of that equipment is operated under conditions difficult for the designing engineer to predict. It is designed for operating loads which are in some cases, close to the limits of the material. Its drilling equipment is subjected not only to very high loading, but to bending, torsion, corrosion, mechanical wear, and other conditions.

Nondestructive testing by any of a number of modern methods offers tools which enable an equipment manufacturer or an operator of that equipment to greatly reduce the chance of future failure. These tools, such as X-ray and gamma ray, magnetic-inspection methods, and more recently the ultrasonic tests, are valuable on the basis that they are economically sound.

Magnetic-particle inspection is one of those methods which has been found economically sound and widely applied in many industries during the last 20 years. First, the method is applicable only to the detection of flaws in materials which can be magnetized. This includes, of course, all iron and steel and many iron alloys, but does not include austenitic alloys of various compositions and, naturally, does not include nonferrous materials such as aluminum, bronze, etc.

The method depends for its operation on the fact that, if a crack or crack-like discontinuity in a piece of magnetized material is so located as to be transverse to the direction of the magnetic field in the material, that field is distorted and the flux lines are crowded or deflected around the ends of such a magnetic obstruction.

When the obstruction lies near enough to the surface of the material, Fig. 1, some of these flux lines will be crowded outside the material itself, and a leakage field is produced at the surface at a point over the discontinuity. The nearer the discontinuity is to the surface, Fig. 2, the stronger is this leakage field, and if the discontinuity actually breaks the surface as, for instance, a surface crack, the leakage field is quite strong and highly localized.

Outlining Discontinuity

If fine particles of magnetic material be applied over such a surface in the vicinity of such a leakage field, some of the powder will be attracted and held by the leakage field, thus setting up a magnetically held pattern outlining the discontinuity.

The greater the obstruction in the magnetic path, the stronger the leakage fields. Sharp, deep cracks at right angles to the surface give the strongest patterns, and large discontinuities below the surface, having a principal dimension of 90° to the surface, are more favorable for the production of strong indications. Small defects, or defects of unfavorable shape, must be close to the surface to be found at all.

Magnetism of proper strength and direction for the part to be inspected can be induced in several ways. In the early days, portable electromagnets were widely used as a source of magnetizing force. In the light of subsequent experience, this method has been shown to be least effective, though still used under certain circumstances.

Coils into which parts are placed, or coils wound with flexible cables to suit the size and shape of the part, are extensively used in many applications, but the direction of such fields is not easily controlled in odd-shaped parts. Also, there is an excessive amount of general leakage field, because the magnetizing force is external and the flux path is completed through the air outside the material in which the defect is sought.

A much more effective method of magnetizing, when applicable, is to pass current directly through the entire part or structure, or locally, as in fillets, by means of prod contacts applied to the surface, in a direction to set up fields favorable for the creation of maximum leakage fields at defects. By this procedure the external flux lines are kept to a minimum, as the field set up by the current flowing through the metal is, to a large extent, contained within the metal itself. The term "circular magnetization" is frequently applied to this method, though in irregular shapes the path of the field is certainly not circular.

Since the direction of the field generated is always at 90° to the direction of the current, it is quite possible in most cases to set up a

(Continued on page 70)

*Magnaflux Corp., Chicago. Summary of paper presented at spring meeting, A.P.I. division of production, Cleveland, April 1950.

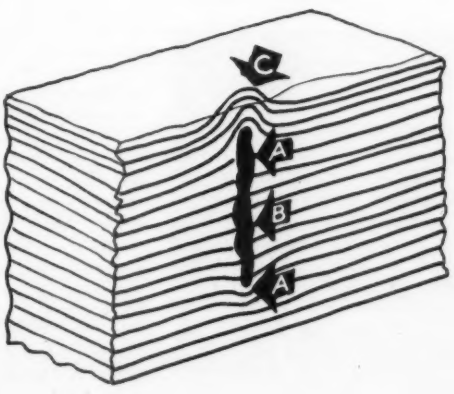


Fig. 1—(Right) Leakage magnetic field pattern caused by subsurface discontinuity.

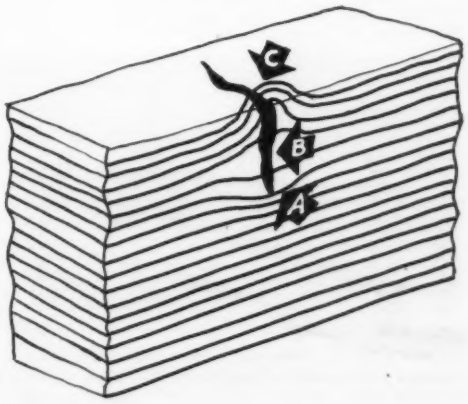
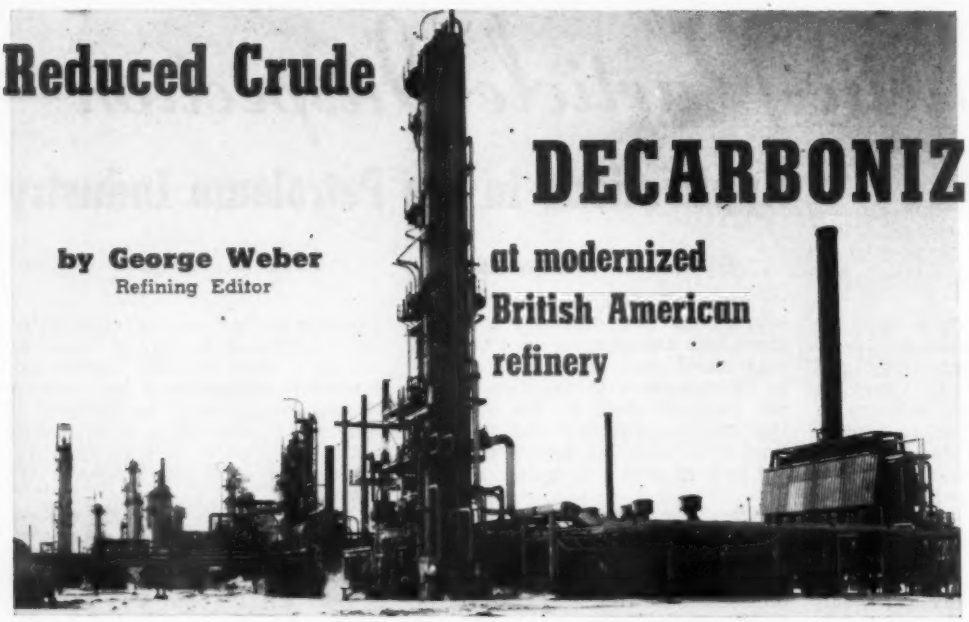


Fig. 2—(Extreme right) Leakage magnetic field pattern caused by surface crack.

XUM

Reduced Crude DECARBONIZATION at modernized British American refinery

by George Weber
Refining Editor



ADDED CRUDE UNIT.— This 14,500-bbl. installation was added primarily to provide feed stock for the new fluid catalytic cracking unit. A 30 per cent reduced crude fraction withdrawn from the bottom of the main fractionator (center), is propane decarbonized for further cat cracker feed.

A GENERAL expansion and modernization program has been completed at the Montreal East Refinery of British American Oil Co., Ltd. Completely revamped, the plant now ranks as one of the most modern in Canada. By nearly doubling crude capacity and by incorporating new processes of advanced design, the company is now amply prepared to meet a growing demand for improved petroleum products in eastern Canada.

The principal additions to the Montreal refinery comprises a 14,500-bbl. per day crude-distillation unit, a propane-decarbonizing unit designed to handle 4,350 bbl. of reduced crude daily, a 13,500-bbl. per day fluid catalytic cracking unit, and facilities for light-ends recovery and polymerization. Existing process units have been revamped and modified to conform to the new operating schedule. Rated crude capacity of the expanded refinery is up from 17,500 to 32,000 bbl. per stream day.

Flexibility Stressed

Flexibility is an outstanding important feature of the new refinery. Based on charging 35° crude oil, the modernized operation allows a maximum combined gasoline yield of 58 per cent. Residual products can, if necessary be limited to an 8.4 per cent premium asphalt fraction plus 8.6 per cent of heavy fuel oil, much of the latter to be utilized as plant fuel. The broad limits within which operations may be adjusted to conform to best optimum market conditions, compare with a former gasoline average yield of 43 per cent and an average residual yield of 12-13 per cent of asphalt and 14-15 per cent heavy fuel oil, based on former crude-charging capacity.

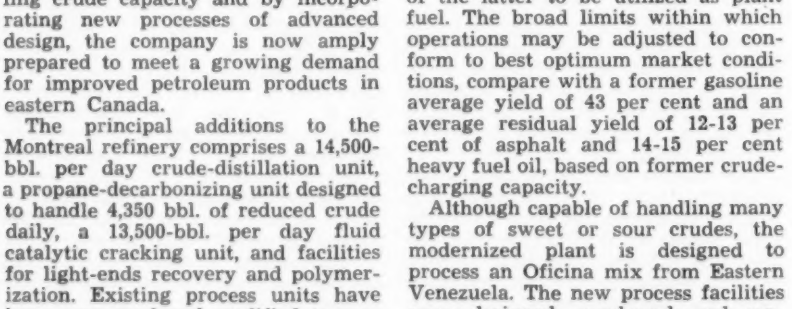
Although capable of handling many types of sweet or sour crudes, the modernized plant is designed to process an Oficina mix from Eastern Venezuela. The new process facilities were designed, purchased, and constructed under contract with Canadian Kellogg Co., Ltd.

New crude unit.—Existing crude units are augmented by a 14,500-bbl. per day addition designed primarily for catalytic cracking feed preparation. Incoming crude after preheat, is charged to a floor-fired heater equipped with two 10-unit rows of burners designed to burn gas or bunker fuel in any combination.

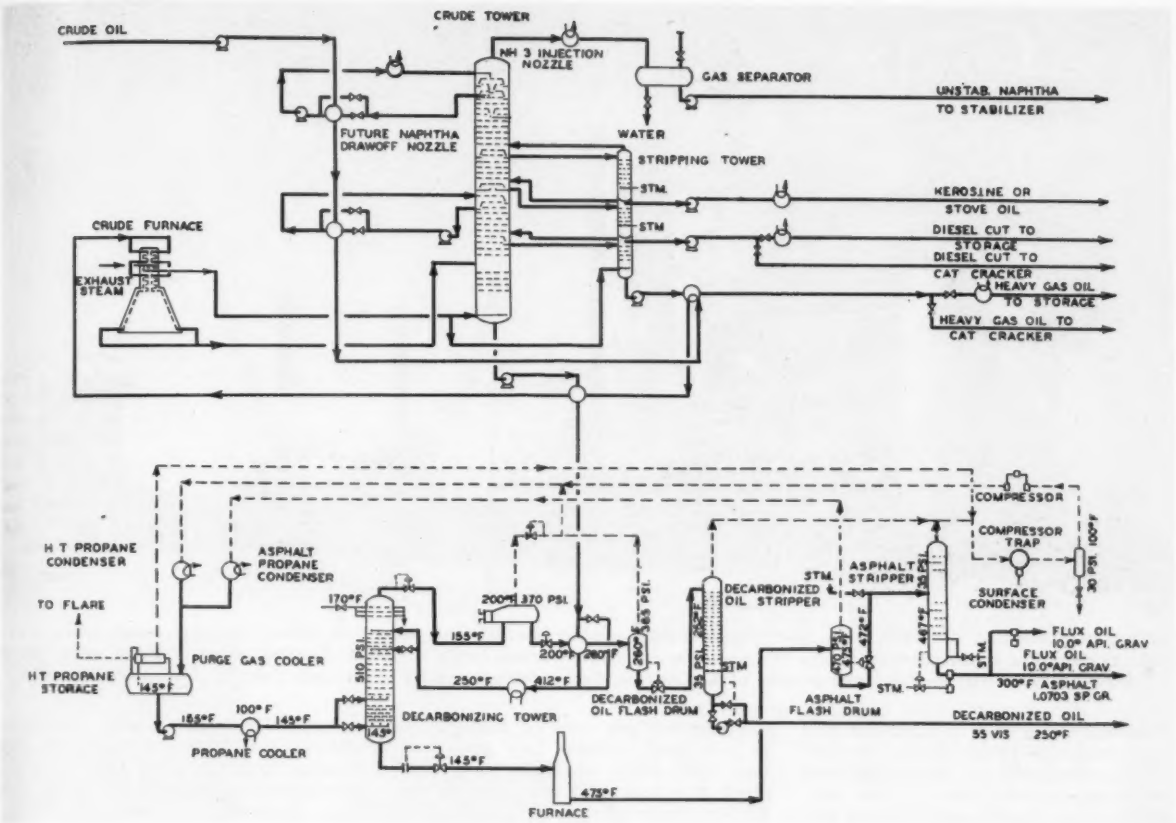
The fractionator provides an overhead product of 350° F.-e.p. gasoline. A naphtha drawoff is provided for possible future use. Three product side streams are currently withdrawn. The kerosine or stove-oil fraction is chemically treated and marketed as such. The intermediate and heavy gas-oil fractions provide cat cracker feed stock, although the former may be finished as diesel fuel. The unit is designed to reduce Oficina crude to a 30 per cent residual fraction.

Decarbonization process. — Incorporated with the crude unit as a part of the catalytic cracking feed-preparation plant, the decarbonization unit is the first of its kind to be built in Canada, and one of the few anywhere in the world. Choice of this process stems from a company decision to maximize output of gasoline and light heating oils and produce a minimum of heavy fuel oil. Solvent extraction of reduced crude produces a catalytic feed stock. Its relatively low carbon content makes it an acceptable cat cracking feed stock. By avoiding the thermal decomposition which would result from recovery of a comparable vacuum distillate, improved quality is obtained in the cracking stock.

In operation, decarbonizing is similar to the propane-deasphalting process. The procedure is outlined in the accompanying schematic flow chart. After heat exchange with the original crude charge and subsequent cooling to 250° F. the 30 per cent reduced crude fraction amounting to 4,350 bbl. per stream day passes directly to the propane decarbonizing tower. At 510 psi., intimate contact with a countercurrent stream of



NEW OFFICES.—Included with a new laboratory and central stores and shops is this modern administration building at the Montreal East refinery. It is equipped with radiant floor heating.



***SCHEMATIC FLOW CHART.**—Flow diagram of the feed-preparation unit for the 14,500-bbl. per day cat cracker.*

propane effects separation of asphalt components by selective solubility of propane at tower conditions.

Decarbonized oil, representing 80 per cent of the reduced crude charge and 24 per cent of original crude, is withdrawn overhead in propane solution at 170° F. A propane-asphalt solution containing the remaining crude fraction is withdrawn as bottoms at 145° F.

The decarbonizer overhead passes to a reboiler and a reduced crude heat exchanger and enters the decarbonized oil flash drum at 365 psi. and 260° F. Most of the propane is removed as vapor from the reboiler and flash drum. Remaining propane is removed with steam at 35 psi. in the decarbonized oil stripper. The end product is 3,480 bbl. per stream day of 22.9° A.P.I. gravity stock showing 2.5 per cent carbon residue and a viscosity of 55 S.S.U. at 250° F.

Propane-asphalt solution from the decarbonizing tower is heated to 475° F. in the asphalt solution furnace and propane is removed in the asphalt flash drum at 370 psi. and the stripper at 35 psi. Virgin asphalt of zero penetration and specific gravity of 1.0703 can be finished as paving asphalt or blended with an equal volume of 10° A.P.I. gravity flux oil and used as fuel.

Propane loss from the system will be negligible. Recovery is obtained in a two-circuit condensing system. At 370 psi. propane vapors from the decarbonized oil reboiler and flash drum and the asphalt flash drum, are condensed and pass to working storage. Residual propane vapors and steam from the decarbonized oil and asphalt strippers at 35 psi. pass a surface condenser for water removal, after which the remaining propane is compressed, condensed, and returned to storage.

Propane to the decarbonizing tower is withdrawn from the work tank at the rate of 17,400 bbl. daily, a 4 : 1 ratio as related to the 4,350-bbl. per day circulation of reduced crude. The propane-storage tank, located outside battery limits, consists of a heavy 700-bbl. vessel, a revamped former Dubbs reaction chamber. The decarbonizing unit is served by a blowdown and flaring system evacuating to a 150-ft. stack located apart from the unit site.

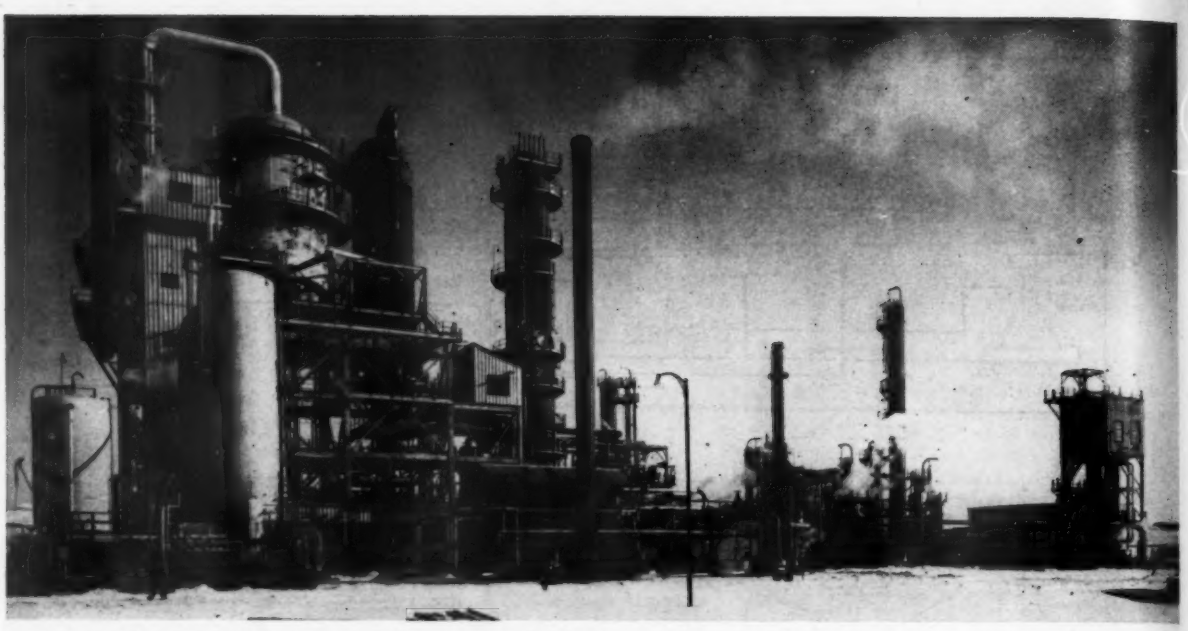
Catalytic cracking unit.—The fluid catalytic cracking unit is the Kellogg balanced type. Feed consists of a blend of five refinery streams comprising per stream day volumes of: 3,300 bbl. of decarbonized gas oil derived from the reduced crude fraction; 2,300 bbl. of heavy virgin gas oil; 1,000 bbl. of intermediate virgin gas oil (all three originating from the new crude unit); plus a balance approximating 3,200 bbl. of light vacuum gas oil and 3,700 bbl. of heavy vacuum gas oil, the latter two streams obtained from an existing combination crude unit at the refinery. Of the five streams, four are charged directly to a surge drum from their original units. The light vacuum gas oil from the combination unit is pumped to storage for water separation. The charge rate of this cold stream is determined by a liquid-level control on the feed surge drum.

The catalytic cracking unit shows no important departures from conventional operation. The mixed feed is charged to a preheater furnace and oil vapors and catalyst enter the reactor through two feed lines. The reactor, measuring 17 ft. in diameter by 47 ft. 5 in., was field fabricated, as was the regenerator which measures 29 ft. 6 in. in diameter and 35 ft. from grid to cyclones.

Flue gases from the regenerator pass through two parallel, three-stage cyclone separator systems and generate 17,000 lb. of steam per hour in the waste-heat boiler before venting to the stack. Cracked hydrocarbon vapors from the reactor are charged to the main fractionator which is equipped with a slurry settler incorporated in the column base.

Cracked gasoline and gas passing

XUM



NEW CANADIAN CAT CRACKER.—The new 13,500-bbl. fluid catalytic cracking unit takes five refinery streams; decarbonized heavy gas oil, virgin heavy and intermediate gas oils, and light and heavy vacuum gas oils. British American plans to utilize spent natural uncalcined clay from the lubricating-oil units at the Clarkson, Ont., refinery for much of the fresh catalyst makeup on this unit.

overhead from the fractionator are conventionally processed to produce stabilized motor fuel, a butane-butene and propane-propylene cut for catalytic polymerization and dry fuel gas. A light cycle oil is withdrawn as light fuel-oil product, a portion of it recirculating as lean oil to the absorbers, and returning as rich oil to the main fractionator. Heavy cycle oil is thermally cracked in existing units in the refinery. Decanted oil provides reboiler heat for the gasoline stabilizer, and generates 33,000 lb. of steam hourly in the slurry cooler before return to the tower above the vapor inlet.

The unit is designed for use with natural catalyst. After normal operation is under way, makeup catalyst will consist largely of spent natural uncalcined California clay recovered from clay-contacting units at the company's Clarkson lubricating-oil plant. This product will be loaded in tank cars as it is dumped from the filters. At Montreal it will be mixed with gas oil and pumped as a slurry to storage, whence it will be picked up as required and charged to the reactor feed inlet. Fresh makeup catalyst may also be added to the unit as a gas oil slurry. The catalyst circulation rate will average nearly 2,000,000 lb. hourly and a catalyst-to-oil ratio of 11.3 to 1 based on fresh feed, is anticipated.

Volume yields from the catalytic cracker and the light-ends recovery units will approximate per stream day: 45.3 per cent of butane-free, 400° F. e.p. gasoline; 9 per cent butanes; 27.9 per cent light cycle stock, and 16.1 per cent heavy cycle stock and, by weight, 5.5 per cent of dry gas and 5.4 per cent of coke, basis 90 per cent carbon. Dry gas from the light ends absorber will fuel plant furnaces and the gas-engine-driven compressors.

Catalytic polymerization.—Existing chamber-type catalytic polymerization facilities will be augmented with a new U.O.P. tubular reactor-type unit. Reactor effluent is depropanized, then debutanized to produce polymer product and butane. Overhead product from the depropanizer column is deethanized to produce ethane and lighter fuel gas and propane; the latter to be dried to specifications for marketing as L.P.G.

Existing Units Revamped

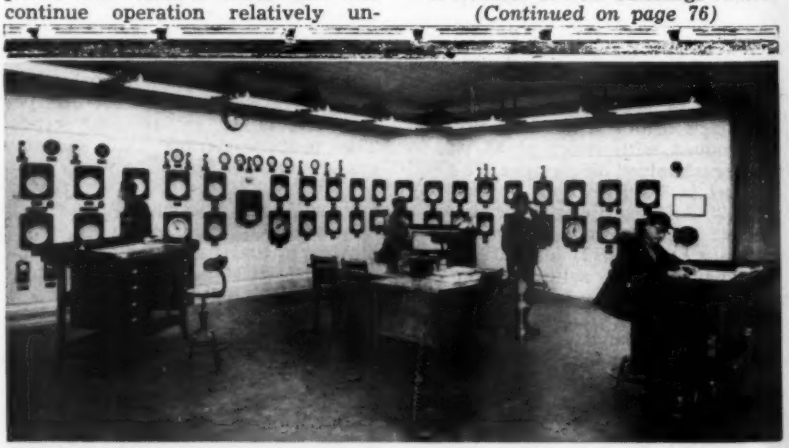
A conventional two-stage atmospheric and vacuum crude unit will continue operation relatively unchanged. The 54 per cent atmospheric bottoms are further reduced in the vacuum stage to a 14 per cent, 50-penetration asphalt. The vacuum gas oils, formerly cracked thermally, now comprise feed stocks for the cat cracker.

A 7,500-bbl. per day thermal cracking unit incorporating two separate cracking coils formerly handled light and heavy gas oils from the combination crude unit. The heavy-gas-oil circuit has been modified to crack heavy catalytically cracked cycle oil. The light cracking coil will handle light atmospheric gas oils and some intermediate gas oil from the new crude unit.

Auxiliary Facilities

A number of new buildings erected

(Continued on page 76)



CENTRAL CONTROL.—This room for the new facilities illustrates the modern instrumentation which makes the expanded refinery sufficiently flexible to handle a variety of crudes for varying yields to meet future product demands.

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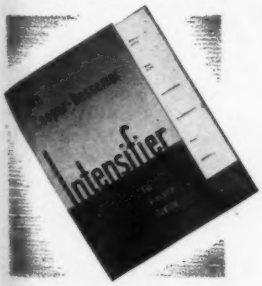

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PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

Tool Design Important in Handling Corrosion-Resistant Alloys

ALTHOUGH the machining of the work-hardening stainless steels requires a different technique from machining of ordinary screw stock, careful shop practice should enable manufacturers further to extend the use of corrosion-resistant materials. Malcolm F. Judkins (Tool Engineer, January 1950) suggests particular attention to prevention or removal of scale, avoidance or correction of the harmful effects of work-hardening, selection of the proper cutting-tool materials and cutting conditions, and employment of efficient tool design and methods.

Because physical properties must satisfy service requirement as well as machining purposes, optimum machinability is seldom realized. A compromise can be effected by trying to control the hardness within the range of 187 to 229 Brinell and to induce as much brittleness as possible by the combined effect of the alloying elements. A coarse grain size, often preferable for machining, can be obtained by controlling the finishing temperature of the hot work performed before machining is begun.

Cutting conditions.—Tool design, including clearances and other cutting angles, must be selected and maintained with care. Cutting conditions, including feed, cut, speed, and cutting fluid, are also important. Tool and cutter performance are influenced by the kind and amount of scale on the surface.

Generally, the technique of machining stainless steels consists of (1) preventive measures, designed to avoid the harmful effects of work hardening; and (2) corrective measures to alleviate the trouble after it has developed. Work-hardening effects can be minimized by avoiding dull tools, intermittent feed, tool rubbing, excessive heat generation, spindle float and slide wear, insecurely held tools and work, and minor machine difficulties which stop the machine or retard its speed.

Heat treatment.—For the straight chromium or ferritic stainless steels, best results are obtained by machining in the cold-worked or cold-worked-and-annealed condition. In this condition, the machining of ferritic stainless is similar to that of 0.4 to 0.5 per cent carbon steel. Annealing practice for these steels is the same as for similar types of structures desired in carbon steels.

The martensitic and austenitic types of stainless are tough and difficult to machine; avoiding causes of cold work is extremely important. Excessive work-hardening can be alleviated by annealing at 1,850° to 2,150° F., followed by air or water cooling. Annealing temperatures below 1,750° F., should be avoided, because carbides precipitated by heating may not be completely redissolved and machining difficulties will result. Too-high temperatures or too long a heating period induces excessive scale and excessive grain growth, causing a rough, orange-peel surface when machined.

A digest from the March 1950 issue of Materials and Methods.

Crack Detection—Use of Powdered Aluminum

A NEW development in magnetic crack detection, reported in the British publication Iron & Steel (January 1950), may save inspection time and ultimately reduce the cost of the process. Essentially, the new technique, developed by Metropolitan-Vickers Electrical Co., Ltd., involves the addition to the magnetic fluid of aluminum powder which retains its whiteness when immersed in paraffin.

Magnetic crack detection is an established and reliable method of examining ferrous parts for surface cracks, flaws, and fissures. Generally, the method employs a thin oil vehicle such as paraffin containing small particles of magnetic iron oxide in suspension. When the fluid is washed over the surface of a magnetized article, the magnetic poles which occur at discontinuities such as cracks or inclusions cause the particles to be attracted and collected, thereby indicating the location of the defects.

It is apparent that good color contrast between the particle formation and the surface of the article under test and slow gravitation of the particles in the suspending medium are essential. The black and red particles commonly used are successful on brightly finished surfaces, therefore, but not so successful on dark surfaces, such as those found on unmachined forgings, stampings, and castings.

In the past, unsuccessful experiments have been made in an effort to produce a white magnetic fluid. Some materials tried were found to settle too rapidly. But the greatest stumbling block was the tendency for most white powders to become dark when wetted with paraffin. The latest experiments have shown, however, that a powdered light-colored metal of low density—aluminum, for example—can be used successfully. Best results have been obtained by ball-milling a mixture of approximately equal parts by volume of aluminum and iron oxide prior to dilution with paraffin or methylated spirits.

Tests have shown that no reduction in sensitivity of the fluid is caused by the addition of aluminum powder. It is believed that substitution of the white fluid would prove economical wherever large numbers of components, such as unmachined forgings, are being inspected by the magnetic fluid method.

A news digest appearing in the March 1950 issue of Materials and Methods.

Minus 300° F. Spherical Vessel

THE testing of experimental 8½ per cent nickel-steel pressure vessels at minus 320° F., was discussed on this page (December 2, 1948, page 107). Now a full-scale 48-in.-diameter sphere has been constructed for service at minus 300° F., when subject to a pressure of 600 psi. or to a full vacuum. Two hemispheres hot spun by Lukens Steel Co. (Coatesville, Pa.) were fabricated and welded by Alloy Fabricators, Inc., (Perth Amboy, N.J.) using a special 80 per cent nickel-alloy electrode.

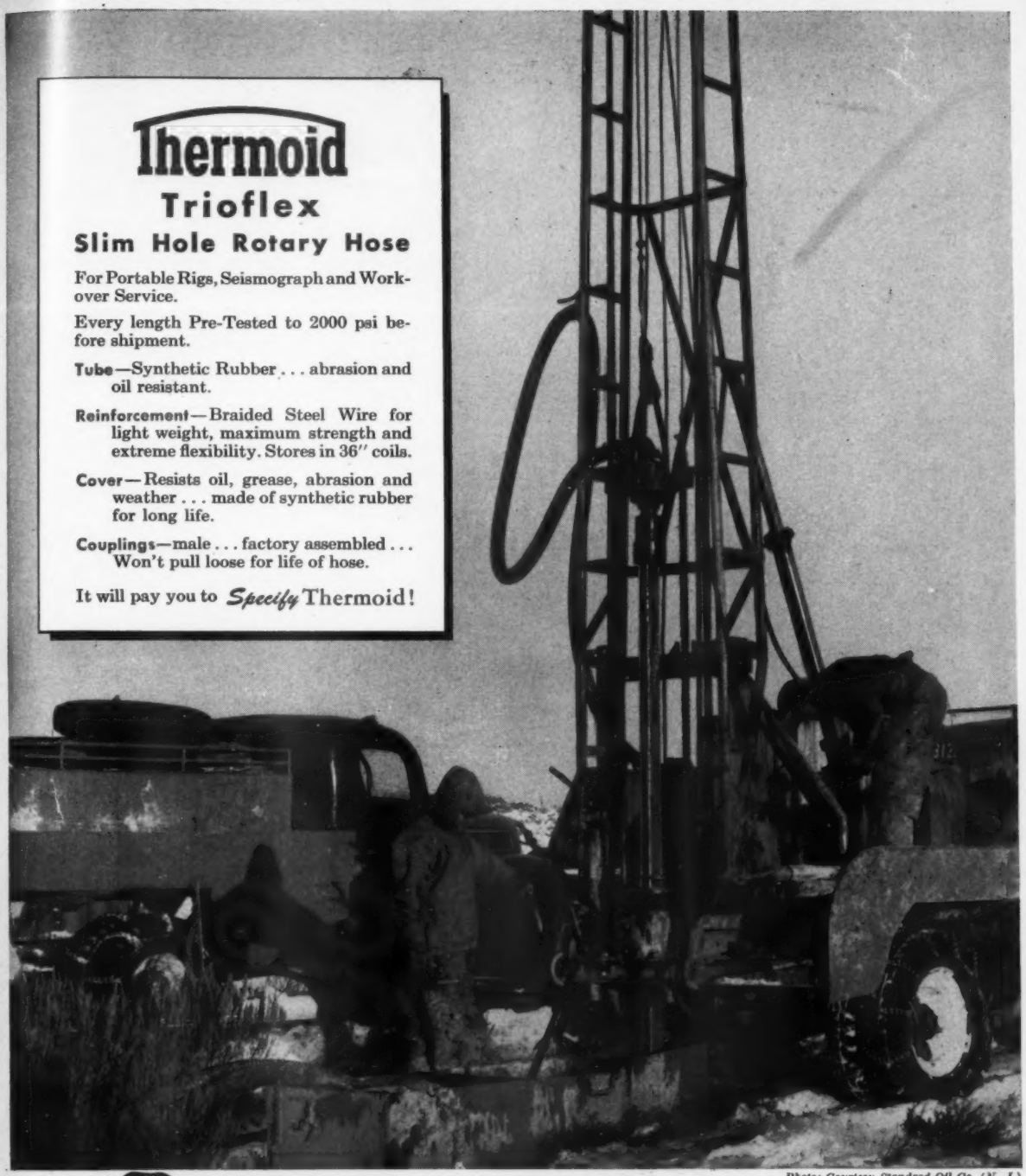
The welds exhibited a yield point of 68,500 psi., a tensile strength of 109,200, and a percentage elongation (in 2 in.) of 33 per cent. Charpy impact strengths (foot-pounds at minus 320° F.) at the center of the weld were 30.5-33, and in the heat-affected zone 18-19. The sphere was stress relieved at 1,050° F. for 3 hours and was finally subjected to a hydrostatic test pressure of 1,200 psi.

The sphere is to be used for the storage of liquid oxygen. Great contraction occurs as the equipment is cooled to minus 300° F., and hence the inlet and outlet connections are steel pipe loops of about the same diameter as the sphere. The weldability and formability of 8½ per cent nickel steel seems to have been adequately demonstrated.

Forging Terms or Operations

STRAIGHTENING

The aligning of semifinished parts that have become distorted during processing. Power or forging presses are used to straighten or flatten the work.



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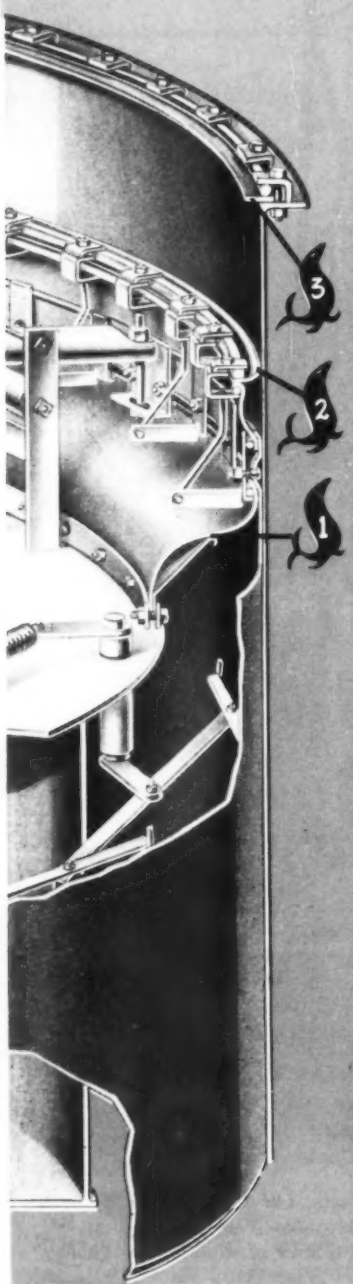

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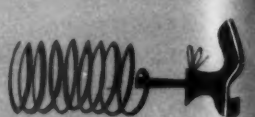
Look and see! Only the Wiggins Floating Roof has the famous Triple Seal. The Primary Seal combines a vaporproof seal fabric with a patented, long limber metal shoe  that exerts a uniform outward pressure, assuring positive constant contact all around the tank walls. The Secondary Seal, a neoprene-coated fabric ring, rides above the Primary Seal to eliminate wind losses around the periphery. The Top Seal says to vapor losses when the float is within the upper 3 feet of the tank top.

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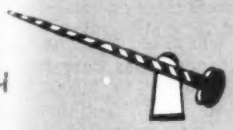
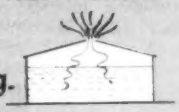
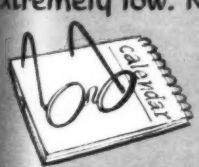
Big roomy pontoons are separated into compartments for greater safety  and much easier inspection. Eliminates venting. 

Tests prove that the Wiggins Triple Seal is the most reliable protection against useless waste developed so far! No explosive gas concentrations can form. In fact, Wiggins Floating Roofs have safely survived intense fires in nearby tanks. Maintenance needs are extremely low. Normal periodic inspection  is the only requirement. Write for all the facts.

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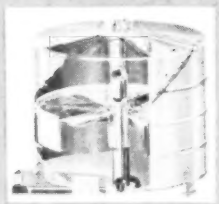

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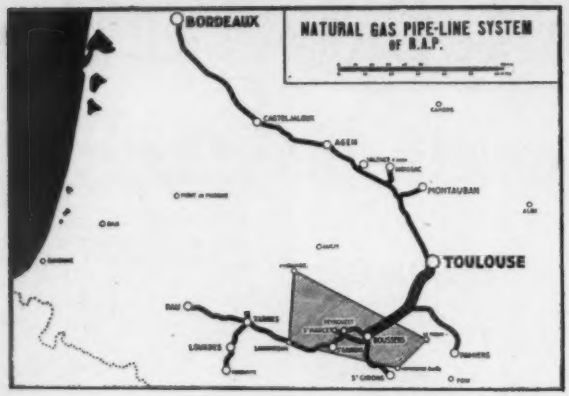


R.A.P. Encounters Toulouse-Bordeaux

by Jean P. La Croix*

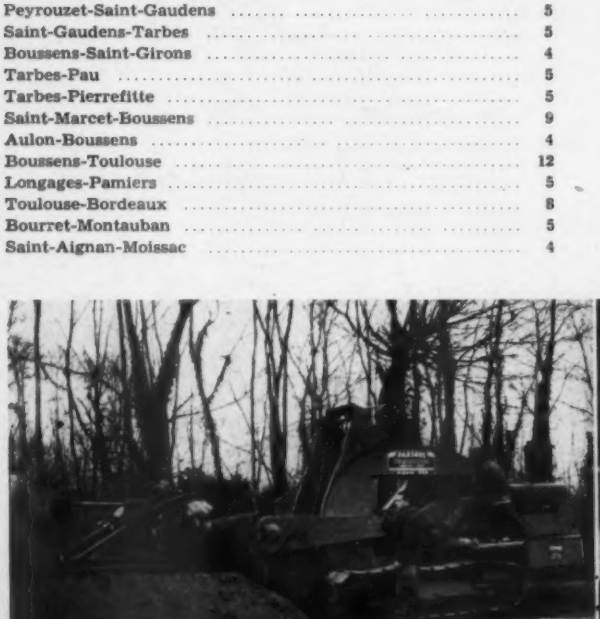
R.A.P.'s PIPE LINE SYSTEM

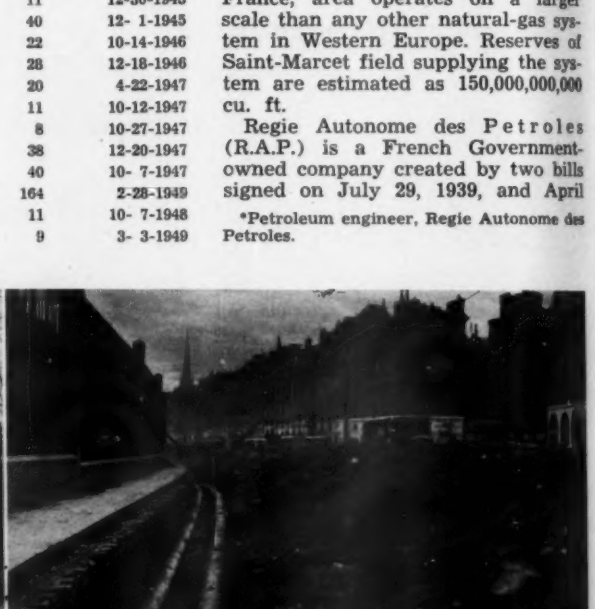
	Size, in.	Length, miles	Completion date
Peyrouzet-Boussens-Toulouse	6	47	11-11-1942
Peyrouzet-Saint-Gaudens	5	11	12-30-1943
Saint-Gaudens-Tarbes	5	40	12- 1-1945
Boussens-Saint-Girons	4	22	10-14-1946
Tarbes-Pau	5	28	12-18-1946
Tarbes-Pierrefitte	5	20	4-22-1947
Saint-Marcet-Boussens	9	11	10-12-1947
Aulon-Boussens	4	8	10-27-1947
Boussens-Toulouse	12	38	12-20-1947
Longages-Pamiers	5	40	10- 7-1947
Toulouse-Bordeaux	8	164	2-28-1949
Bourret-Montauban	5	11	10- 7-1948
Saint-Aignan-Moissac	4	9	3- 3-1949

THE 500-mile pipe line of Regie Autonome des Petroles, transmitting 25,000,000 to 30,000,000 cu. ft. daily in the Toulouse-Bordeaux, France, area operates on a larger scale than any other natural-gas system in Western Europe. Reserves of Saint-Marcet field supplying the system are estimated as 150,000,000,000 cu. ft.

Regie Autonome des Petroles (R.A.P.) is a French Government-owned company created by two bills signed on July 29, 1939, and April

*Petroleum engineer, Regie Autonome des Petroles.





Left: Ditching operation for the 8-in. line from Toulouse to Bordeaux. Right: Along the Bordeaux wharfs. Here the 8-in. natural-gas line is laid down paralleling a 16-in. manufactured gas line.

Left: Electric welding operation in the pine forest of Landes. Right: The line goes on, along the main Highway No. 10, near Bordeaux.

Unusual Problems in Laying 165-Mile Gas-Line Project Takes 10 Months

12, 1941. Chairman of the board of directors is Paul Moch. He succeeded Angot in 1945, who was deported to Germany and died in Buchenwald because he opposed German control. J. H. de Vries, who had been responsible of research and development of R.A.P. since before the war, has been nominated managing director.

Main offices and installations are located in Saint-Gaudens and Boussens, near Saint-Marcet field in the southwestern part of France.

Saint-Marcet Field

R.A.P. has achieved during these last years the development of Saint-Marcet field, discovered in 1939, near the foothills of the Pyrenees Mountains. The development, which had been slowed down after 1940 and practically stopped between 1942 and 1944, due to the war and German occupation, was started again after the liberation of the country.

This gas field is until now the only one of major importance ever discovered in France. Twenty-one wells have been drilled; 12 of them are producing. The wells have good productivity and six of them have open-flow capacities between 20 and 50 million cu. ft. per day.

The reserves have been estimated at about 150 billion cubic feet of gas, as of January 1950.

Pipe-Line System

After the war, and while extending an active drilling program for the exploration of several structures discovered on its lease, R.A.P. developed between 1944 and 1949 an important natural-gas production system. This development substantially contributed to improve the scattered French economy which badly needed at that time any kind of energy.

The over-all length of the pipe-line network is 500 miles and the total weight of steel pipe used in its construction amounts to 20,600 tons.

The field gas, which contains 0.95 gal. of condensate (L.P. gas and gasoline) per 1,000 cu. ft., is collected and processed in a new absorption plant, designed by Hudson Engineering Corp., Houston, and erected at Boussens. This plant, the capacity of which is 42 million cubic feet per day, extracts the gasoline and L.P. gas content. It is equipped with a florite dehydration unit. The line from the field is 11 miles long; its outside diameter is 9½ in. and its maximum working pressure 1,500 psi.—the highest reached in Europe for this size.

The main lines from the gasoline plant have a working pressure of 850 psi. Their size is between 4 and 12 in. (see map and tabulation). Electrolytic corrosion being particularly dangerous in the southwest of France, where most of the lines run parallel to electric railways, the protection of the lines has been especially studied. Each pipe has a protective coating 1/6 to ¼-in. thick, constituted of two beds of enamel and a glass-fiber wrapping. In addition, cathodic protection has been systematically applied to the whole system. It is the first time in France that it has been used to such an extent.

Twenty-five to thirty million cubic feet of gas are transported daily through this pipe-line system. It is expected that within 2 years the field output will reach 35 million cubic feet daily. The gas flows naturally from the field, where the shut-in pressure of the wells is 1,750 psi., to the Boussens plant where the pressure is reduced to 850 psi. The pressure of the gas delivered to the customers is about 50 psi.

The natural gas is used mainly for replacement of manufactured gas, for furnace and boiler heating, and for hydrogen manufacture. It is also used as motor-fuel gas for especially equipped vehicles (filled at 3,000 psi.). Seventeen compressor stations have been erected for this purpose along the pipe-line system.

Toulouse to Bordeaux

The latest pipe line constructed by R.A.P. was the line from Toulouse to Bordeaux, laid in 1948 and 1949. Its over-all cost was 1½ billion francs; the project has been engineered and the construction directed by the specialized staff of R.A.P. The right-of-way follows the banks of secondary highways and of the Canal du Midi, avoiding populated areas, towns, and villages.

The project included the construction of 165 miles of main line 8-in. in diameter, and 20 miles of branch lines, 5 and 4-in. in diameter.

On the main line, about every 10 miles are installed main control valves from Nordstrom or Audly Engineering Corp.

The whole project was completed on March 1, 1949, within 10 months, instead of the 2 years initially foreseen. This considerable time saving was due to the improved situation of the steel industry resulting in a faster delivery of pipe, and also to the large quantity of mechanical equipment used in the construction of the line.

Although the completion rate is not up to United States standards, it seems to be the best that can be done in a country such as France, where the density of the population and the resulting difficulties prevent using mechanical equipment on a substantial part of the right-of-way.

The pipe used in the project was seamless pipe simultaneously made by the two French companies Escaut & Meuse and Vallourec in their modern steel mills located at Valenciennes and Aulnoye, in the north of France. The steel was a grade A, with a tensile strength of 50,000 to 60,000 psi. The chemical analysis was as follows:

C	0.08 to 0.20
Mn	0.3 to 0.6
Si	≦ 0.15
S	< 0.045
P	< 0.045
S + P	≦ 0.080

Each length of pipe before delivery was hydraulically tested at 1,400 psi. for 15 seconds.

Construction

The construction was performed by six French contractors: Société Auxiliaire de Distribution d'Eau (S.A.D.E.), Société Chaumeil Versillé, Société Entrepose, Société d'Entreprise de Canalisations (S.E.C.), Société d'Entreprises du Comminges, Société Parisienne pour l'Industrie Electrique (S.P.I.E.).

The pipe was received in railroad stations located near the right-of-way. Handling, trucking, and laying down required trucks, cranes, tractors, side booms, etc., of French and American made, most of them, from the army surplus.

Welding.—The pipe was delivered with butt joints beveled at 30°. The joints were electric welded with three beads in order to obtain an extra thickness of 1/12 in. over the pipe wall.

The total number of welding machines used on the job amounted to 45; they were of the American makes, Hobart, Lincoln, and the French made Sarrazin.

The electrodes were Fleetweld or Vertex AWS 6010 or Sarrazin 55 P.C. The contractors employed welders

(Continued on page 79)

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Economics of Contract Drilling IN CALIFORNIA

by R. A. Powell

DISCUSSED here are economic trends of contract drilling. The several points are made not as an expert economist; not as a drilling expert, but simply as one whose long experience in estimating costs, and balancing income and outgo, has developed a natural inclination to look into the economics of all operations.

Operating Costs

Labor.—Let us consider some of the cost changes in contract drilling that have taken place within the past 3 years. There is no question that in any species of enterprise, man is the most important element, and there is no question either that under our system of free enterprise, the lot of the working man has steadily and markedly improved.

The lot of our workers has definitely improved in all positions throughout the time under discussion, not only in the matter of remuneration for his services but in the secondary process of providing him safe conditions in which to work. This latter may in the long run be a profitable investment, but to the callous mathematical eye it represents an immediate and in some instances sizable expenditure.

Looking at wages specifically, the most important individual in our particular labor category is the driller, and his take-home pay has been increased during the 3 years in question by approximately 26 per cent. A driller is now paid $20.20 per day before taxes. That is a pretty substantial boost any way you look at it, but it is only a part of the total story.

The cost of workmen's compensation insurance rose some 15 per cent to a present manual rate of $6.15 per $100 of payroll because of the increased cost of medical, surgical, and hospital services. Federal old age benefit contributions rose 50 per cent from 1 to 1½ per cent of the first $3,000 of earnings. So-called "fringe" items, during this same period, became more and more costly. Employe life insurance jumped 14 per cent.

There is literally nothing in the entire gamut of what might be termed employe protection and benefits that hasn't climbed steadily costwise during the past 3 years, and yet, instead of reducing these benefits to compensate for increasing cost, the tendency of industry in general, and our own in particular, has been to enlarge them and to widen in every possible way the scope of employe protection. Labor and supervision per crew day have increased from $329 to $430 in 1950 or an over-all increase of 30 per cent.

Rig supplies.—Next, let us examine the status of operating equipment and consumable goods, or whatever you choose to call the tools and supplies that are used in contract drilling. They consist of bits, hole openers, core heads, soft rope, wire lines, fuel, lubricating oils and greases, and a miscellany of small hand tools and other items too numerous to list here.

R. A. Powell is secretary and treasurer of Santa Fe Drilling Co., Santa Fe Springs, Calif. Powell graduated from Oregon State College. He was with Union Oil Co. of California from 1927 until 1947, in the comptroller's office working first at the Los Angeles refinery, then at Santa Fe Springs field office, Bakersfield field office, and head office in Los Angeles. In February 1947 Santa Fe Drilling Co. was formed and Powell has been associated with it since that time.

By the way, it may be a trifle aside from the question, but if some of you operating men could tell me why so many crescent wrenches, derrick hatchets, shovels, and hand saws are needed on every drilling rig, I would surely be grateful for the information.

Some of these hand tools have gone up in price 100 per cent during the last 3 years, and just to convey the general idea, a few of the other items that have been skyrocketing are drilling bits, which have risen 23 per cent —from $181 to $222 for a 12¼-in. bit, soft rope up 20 per cent from $0.44 to

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$0.53 per pound, and wire lines up 46 per cent from $0.26 to $0.38 per foot. I might say here, also, that the increased value of gas fuel has been one of the deciding factors in the adoption of power rigs, and the reduced employment of steam.

There is no apparent leveling out of prices up to the moment and what might happen during the next 3 years would be very difficult to predict. The unit cost of rig supplies has, in my opinion, increased an average of 17 per cent.

Transportation.—There seems to be no end to the story. The cost of trucks, cranes, etc., used for moving in, rigging up, dismantling, and moving out, has increased. The total cost of moving a rig today as compared with the same cost in 1947 is not easy to determine, because the same set of conditions seldom prevails in two separate projects.

The main factors influencing cost are accessibility of location, spud date, distance of move, and weather conditions. (The spud date is important because wages, as you know, increase on Saturday, and increase still more on Sunday.) These are more or less direct charges of which we feel the impact at once, but there are others, what we might call concealed items, that can cause us just as much distress in their subtle way. The cost of transportation has increased 10 per cent, in my opinion.

Depreciation.—One of the troublesome cost items is depreciation; the number one bugaboo of the contract-drilling business—and most other businesses, too. Although a large item of cost, its basis is indeterminate and in many respects, illogical, and there doesn't seem to be much we can do about it. It wasn't much of a problem prior to the enactment of the Federal Income Tax Law, but it has certainly made up in the meantime for the slow start.

A thousand experts have tried to define the term "depreciation" and its theoretical and practical application; that is, in an accounting sense, but it still is a doubtful quantity. My own pet definition is that depreciation is cost plus maintenance, less salvage recovery, and is due to use, wear and tear, physical deterioration, obsolescence, inadequacy and demand.

The depreciation cost is, of course, distributed over the useful life of the equipment or machine to which it is to be applied, and there is some indication of its indefiniteness in the fact that even accountants are rarely in agreement as to the figure in any given instance.

Incidentally, the Internal Revenue Act, as it now stands, does not take into consideration the cost of replacement, and makes no adjustment for the continued rise in prices of replacement items, both of which are certainly pertinent factors in any measure of depreciation.

Supervision and overhead. — Another considerable contributor to the total cost of a drilling project is what we call "Supervision and Overhead." Here again a large increase is to be noted in the past 3 years. It approximates 25 per cent, but the accurate amount depends largely on the number of wells being drilled, and their location. Obviously, if a sizable number of wells are being drilled within a comparatively confined area, or in locations that are in close proximity to the contractor's headquarters, the cost of operation in many phases, including supervision and overhead, may be decidedly reduced. In this connection, I might point out that at least 25 per cent of the latter cost is attributable to the preparation of records and reports, demanded by a diversity of governmental agencies and authorities, and ultimately used to fix the various forms of taxation that make life so rugged in our business nowadays. It is amazing that in spite of the multiple and manifold taxes already imposed on us, the state and federal bureaucrats can still think up new ones.

The breakdown of the contractor's time and cost estimates in the drilling of any well is based on the following well recognized operational intervals: Move in; rig up; through surface casing; through oil string; drill out; day work; dismantle, and move out.

Daily operating costs. — The total daily cost of operating a drilling rig was $983 per day in 1947. In 1950 the same rig costs $1,162 per day or an over-all increase of 18 per cent.

Summary on operating costs. — While the various foregoing operating items entering into the drilling costs have increased in the manner described, the increasing efficiency in drilling has kept the cost per foot from increasing in the same proportion.

In the accompanying table is a comparison of the cost per foot and the cost per day of wells drilled in 1947, and wells drilled in the last quarter of 1949 and the first quarter of 1950. This table is based on average experience of bottom-hole contracts of similar depths.

Footage Rate Costs to Operators

Factors affecting rate.—It is significant that approximately 72 per cent of all drilling costs are chargeable to time. The drilling contractor must in consequence budget his time with the utmost care, and never relax his efforts to remove every impediment to the drilling process.

From an analysis of 400 development wells, drilled during the 3-year period under consideration, the actual "making hole" time has been decreased by 16 per cent.

I might say that I made some effort to determine whether or not completion time had decreased during the 3-year interval we are discussing, but I found that completion practice varied so much with subsurface conditions that it was utterly impossible to strike anything like a comparable relationship.

We have what seems to be a pronounced paradox: While the cost of labor, equipment, and most other involved components of oil-well drilling have continued to increase over the past 3 years, **the footage cost to the operator has declined.** In one field the footage price has declined from $7.65 to $5.25 per foot. In another field, the footage price has declined from $6.35 in 1947 to $5.45 per foot in 1950.

This, in my opinion, is due to the following: Increased know-how of crew members (most important); improved supervision; new equipment; new processes; new devices, and new techniques.

In order that a contractor may hold his efficient, well-trained, and experienced crews, there must be a continuity of work. Conversely, in order to secure continuous work the contractor must constantly improve the skill of his men and the quality of supervision.

From our own experiences, it looks as if the trend at the moment is more and more toward fuller service on the part of the contractor. The latter is now being looked to for such services as road building, site preparation, sump digging, and for the furnishing of blowout-prevention equipment, conductor pipe, fuel storage, fuel, casing and tubing tools, and all manner of incidentals.

Relationship Between Operator and Contractor

Contractor's position.—Now having discussed increased operating costs and what we have done to offset them, we are in a position to discuss rationally the relation between the contractor and the operator—to deter-

	1947			1949-50		
	Cost per foot	Per cent	Cost per day	Cost per foot	Per cent	Cost per day
Labor and supervision	$2.29	34	$329.52	$2.14	37	$430.40
Supplies	.40	6	57.85	.35	6	65.60
Maintenance of tools	1.01	15	147.53	.64	11	127.38
Bits	.89	13	124.35	.87	15	172.30
Drilling fluids	.41	6	59.94	.29	5	58.12
Trucking and services	.62	9	89.34	.58	10	118.14
Site preparation	.13	2	23.33	.18	3	34.86
Depreciation, overhead, and misc.	.98	15	151.26	.76	13	155.53
Total	$6.73		$983.12	$5.81		$1,162.33

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mine, in other words, what the contractor has done and can do to keep well drilling costs at a reasonable level. After all, the contractor has nothing to offer the operator if he can't function as well as the operator can himself, at a lesser cost per foot, or at the same cost per foot, ridding him coincidentally of all the worries that normally go with the drilling job—including maintenance and accounting for a large inventory. It is evident that operators generally believe in the contract system for a majority of the wells drilled in California are the work of contractors, and the national proportion is even higher.

Services offered by contractor. — It seems obvious, and again may I remind you that I am speaking from my own experience, that the drilling of oil wells under contract should be attractive to operators for a number of reasons. To begin with, the contractor is a specialist whose entire time, thought, effort, and personnel, are devoted to a single purpose. He is bound, I think, through concentration and selective application, to become especially expert in all phases of his business. He has greater freedom of action, and is constricted only by the terms of his contractual agreement. Consequently, operational problems are tackled—and solved—right at the well, and the process of making decisions is certainly somewhat less complex.

A number of oil companies and large operators contract all well drilling; some contract nearly all; and a few contract their wells only at time of peak activity and heavy drilling schedules. It is my belief that, taxwise, operators can make good use of drilling contractors to increase or decrease exploration and development expenditures, as the occasion demands. There is plenty of justification for a high rate of drilling in the rapidly growing demand for petroleum and its products, and we can certainly not rest with any sense of security until we have sufficient proven reserves to take care of any and all national emergencies.

One of the best arguments for the contractor is his flexibility. He can distribute his equipment and crews quickly in many directions and for many operators at the same time, the process being limited only by the number of drilling units under his control. The oil operator, on the other hand, is subject most of the time to a widely fluctuating demand, and must equip himself to take care of the peak situation. Thus, he must of necessity have at other times a varying inventory of idle equipment, and that is not good.

The contractor is also subject to fluctuating demand, but, not being confined either territorially or constitutionally, is in a better position to keep his rigs active than is the private operator. By the same token, the operator will find it profitable to engage a contractor because over a period of time the latter's footage cost is bound to be lower for the reason that the operator pays only for active time and is not obliged to pay his crews during time of inactivity.

Supply and demand related to drilling rigs.—When there is more efficient drilling equipment around than the industry needs to drill its wells, intense competition results and drilling prices go down. During the past 3 years we have experienced the entire scope of conditions from an urgent need for drilling rigs to the prevailing excess of them. While the rigs were in demand, new and improved equipment was developed and purchased. Now that we are in a slump occasioned by too much equipment or too little drilling, everything has inclined to revert to the status quo. Genius is stifled and a lot of drilling equipment is being disposed of, or is gradually depreciating into that lamentable state we term "obsolescence." That is neither good for the operators nor the contractors.

Summary and Conclusions

Summing up, it seems to me that it is time for all of us to quit looking on contract drilling as a sort of delicate baby industry that needs a lot of coddling to keep it alive. If we haven't grown up now, it is time we had. We are a responsible segment of the oil business, and all we need do to hold our proper place in the scheme of things is to conduct ourselves in a businesslike way, remembering that the economics of contract drilling is much the same as the economics of any industry. It is simply a matter of producing results in the most efficient way at the lowest possible cost.

In this presentation I have tried to show that in the face of increasing labor and equipment costs, we are still managing to reduce the footage price to our clients. But I would like to say, in addition, that we stand a good chance of losing the gains we have made if we remain idly and quietly by while an army of irresponsible bureaucrats pyramid our already overheavy tax burden to unbearable proportions.

The drilling - contracting industry has demonstrated that it is in the main thoroughly responsible and reliable. The proportion of wells drilled under contract is pretty convincing evidence that the operators—both large and small—recognize this fact. If, therefore, we are to continue to enjoy this patronage, and if we are to sustain the efficiency we have already achieved, we must at all times not only strive for the very best in mechanical performance and technical know-how, but we must at the same time keep ourselves constantly apprised of cost trends and their prospective effects on ultimate footage rates.

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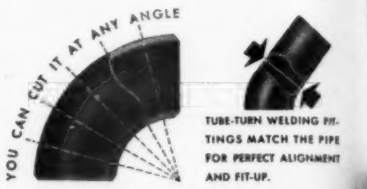

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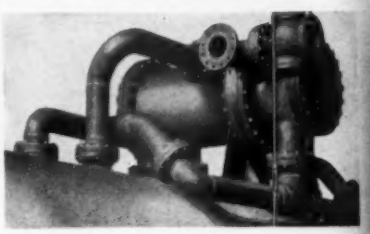

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Underground Storage of L.P. Gases . . .

(Continued from page 52)

point measured April 12, 1950, after approximately 2,500 net barrels of material had been added, was 1,728 psig., which points up the fact that water has actually been displaced from the reservoir. The over-all average maximum injection pressure of 1,970 psig. was 525 psi. above original pressure and was sufficient to cause effective flow across the permeability barrier. The minimum reservoir pressure reached during production was 1,563 psig., about 118 psi. above original pressure for the entire Paluxy sand and was therefore still high enough to prevent effective flow from the main sand body back into the trap.

The pressure-volume performance for both the first test and the market period closely resembles the behavior of a constant-volume-type gas reservoir. The source of energy causing reproduction by "natural flow" may be correlated with this performance by considering two well-known facts. First, the range of pressures and temperatures prevailing under these conditions were such that the compressibility of the liquid propane could be entirely ignored.

Second, the solubility of natural gas in salt water can be fairly high. Conclusions showed this second fact could be the only effective source of energy available to provide "natural flow." Although the actual quantity of dissolved gas, in terms of cubic feet per barrel, was not determined its presence was verified by a fractional analysis of gas liberated from the water produced from the relief well. Analysis showed the following constituents: methane 98.56 per cent, ethane 0.88 per cent, and propane plus 0.56 per cent.

Based on the assumption that the solubility is 15 cu. ft. per barrel, a reservoir balance for injection when the net material added was 21,000 bbl., correlates with a similar balance for the marketed propane.

The original plan which called for storage of some 150,000 bbl. plus allowance for expansion is expected to be fully utilized this coming year, and attainment of comparable recoveries will improve the economic outlook of this project. The present recovery factors may be summed up as follows:

	Bbl.	Per cent
Total volume of propane:		
Injected	53,220	100.0
Reproduced	16,571	30.9
Marketed	13,391	25.1

The actual rate of payout and over-all maximum economic success is coupled directly to the market price which is obviously unpredictable. However, the wide latitude in value between propane as a vapor and as a liquid in at least this particular instance has provided a favorable economic result even though the original projected operation was only partially completed. Value of the total injected propane as a vapor with the value of that actually marketed as a liquid is shown below. Of special note is the fact that the total volume as a vapor includes the "cushion volume" which was a considered loss in the original plan.

Total value of 53,220 bbl. of propane sold as a vapor at $0.05 per M.c.f.	$3,570.00
Average value received for 13,391 bbl. actually marketed	16,900.00

$$\text{Value ratio: } \frac{\text{Liquid}}{\text{Vapor}} = 4.7:1$$

Possibilities for expansion of this first installation are not limited as yet and plans for this particular trap include a second group of relief-flood wells concentric with the first. This second group could increase the presently available storage space to more than 1,000,000 bbl. Also, when this first trap is delimited a second trap is available as shown on the isovol map, Fig. 2.

In summation it is to be specifically noted that this one project has not solved the over-all L.P.G. storage problem from an industry-wide standpoint. However, we believe it will prove helpful in planning additional projects of this nature which, when placed in operation, will provide the desired cushion for the industry's seasonal storage problems.

Each project of this type will present different problems which can be solved only for the individual case. The results of this project permit the following conclusions:

1. The L.P.G. could be withdrawn, at will, from storage to supplement daily production.

2. The volume recovered by uninterrupted natural flow indicates a much higher recovery efficiency when water-flood or mechanical pumping means are provided.

3. From the standpoint of economics the underground storage of L.P.G. appears to have been successfully accomplished.

Magnetic-Particle Inspection

(Continued from page 53)

field by this method in a desired direction by properly locating the contacts.

The possibilities of varying the sensitivity of the method are numerous and complex. Obviously, the stronger the magnetizing current, the stronger the field, and because of the magnetic behavior of materials, stronger fields always exist while the magnetizing current is flowing than after it is cut off. The residual field which a part retains is always only a fraction of that present while current is flowing. The residual field is also a function of the composition and hardness of the material, as well as of the amount of magnetizing current applied.

For maximum sensitivity it is evident that it is better to apply the magnetic powder simultaneously with the flow of the magnetizing current to take advantage of the stronger field then existing. This is the so-called "continuous method." Sensitivity may also be affected by the choice of magnetizing current, i.e., alternating or direct. Alternating current, because of skin effect, magnetizes the surface layers of material more strongly than those deeper in the part. Direct current, on the other hand, penetrates more deeply into the cross-section.

The continuous direct-current method is the best for maximum sensitivity for the location of discontinuities lying below the surface. However, if interest lies only in surface cracks or discontinuities very close to the surface, alternating current is usually equally, and sometimes more, effective.

The reasons for greater or lesser sensitivity are obvious. On certain occasions the most searching inspection is desirable. Under other conditions superficial diagnosis is indicated.

When it is desired to locate subsurface defects, the use of half-wave rectified single-phase alternating current is much to be preferred. The pulsating direct current gives good penetration of the magnetic field, and, at the same time, causes the powder particles to move about on the surface. The powder is then attracted to areas of the leakage field more readily than under the influence of nonfluctuating direct current.

The magnetic particles are available in two general types. Dry powder is made in gray, black, and red colors to give the best color contrast with the color of the parts being inspected. In general, the dry powder is used on large parts or rough surfaces, such as welds and castings.

The second type of particle is used in the so-called "wet method." These particles are extremely fine and are suspended in a light distillate, which is applied to the surface of the part. The wet particles are much better for surface cracks than subsurface, and on finish-machined surfaces The wet particles are made in black and red colors, and also in a form which fluoresces brilliantly under "black light."

Gradual deterioration known as fatigue begins to take place in parts subjected to repeated stresses. Users of equipment employ the method for locating tiny fatigue cracks by periodic inspection. In the petroleum industry this method of testing has been used in drilling, production, transportation, and refining.

There are many factors which influence the failure of drill pipe. Tongs and slips may scar the pipe

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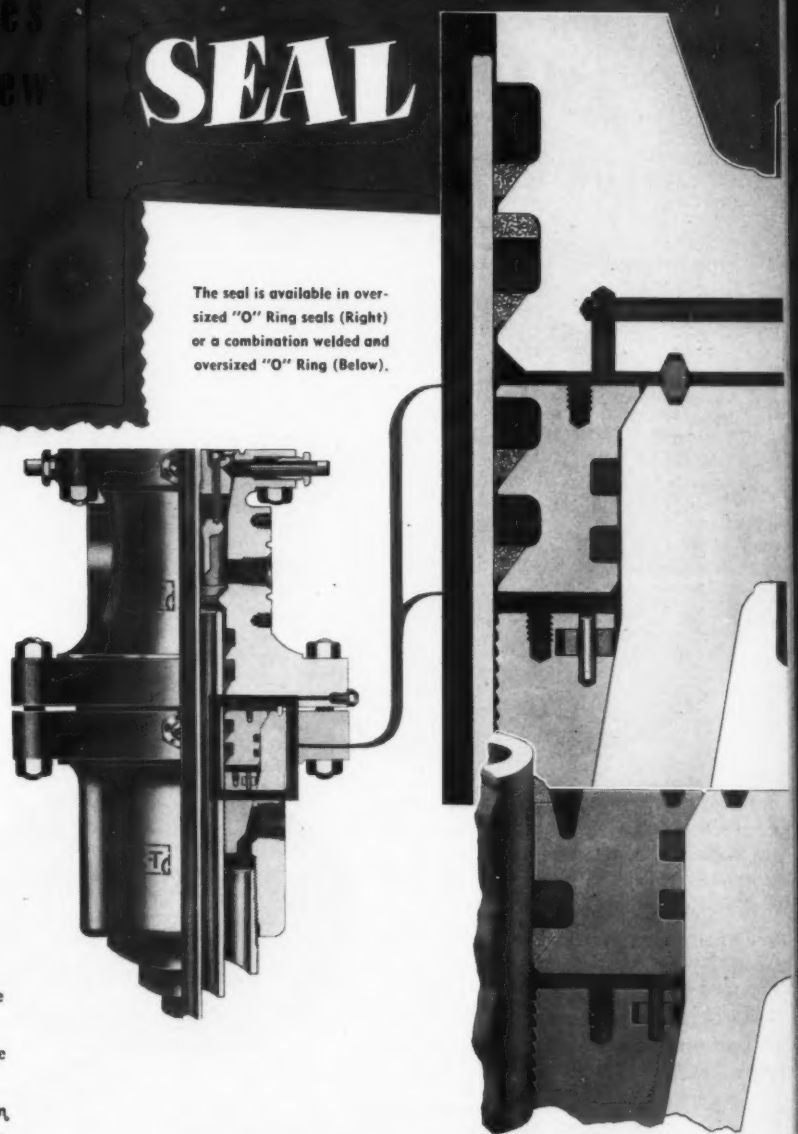

The seal is available in oversized "O" Ring seals (Right) or a combination welded and oversized "O" Ring (Below).

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You can argue quality at the surface but it's proved at the bottom of the well

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AXELSON PETROLEUM PUMPING EQUIPMENT

and these scars are dangerous stress raisers which frequently lead to fatigue failure. In the inspection of box or pin threads, particularly the female thread, the use of fluorescent magnetic particles offers a great advantage. It is frequently difficult to obtain clear, readable indications of a crack in the bottom of a thread with the usual dry powder. The much smaller and highly fluorescent particles which are suspended in light oil can be sprayed over the threads and the indications stand out clear and distinct when viewed under a portable black light.

From the work which has been done on the inspection of drill pipe in the mills and the use of the method in the plants of many manufacturers of drilling tools and equipment, the widest use in the petroleum industry has been in refining. There, emphasis has been on inspection of welds of pressure vessels, piping, and storage tanks of many kinds.

Always when weld inspection is mentioned, it seems natural to infer that this method of testing is used competitive with X-ray. This is not the case. One method is not an alternative for the other, although it is true that they overlap somewhat. In general they reveal different types of discontinuities. The method described here is at its best in detecting those discontinuities which are at or near the surface, and particularly the narrow, close-lipped type, such as cracks.

X-ray and gamma ray most readily reveal subsurface discontinuities such as blow holes, slag inclusions, and lack of penetration. For example, in heavy-wall pressure vessels fabricated by multiple-pass welding, it has been found practical to inspect each layer of weld metal before subsequent passes are made. Subsurface porosity can be detected as well as lack of fusion as the weld is built up.

In the field of oil and gas transportation, the use of this method up to this time has been quite limited. Its most extensive application has been in certain mills manufacturing welded pipe where it is used as a 100 per cent inspection tool to insure that the pipe welds are sound. In one mill, a special unit immediately follows the resistance welder, and the welding-machine operators can keep their operation under control by means of watching for indications of cracks and other defects immediately as they occur. This inspection has resulted in a reduction of the percentage of pipe failure during the mill hydrostatic test from 5 or 6 per cent to below 1 per cent.

Sufficient work has been done in the field to prove the effectiveness of this method in the inspection of submerged-arc longitudinal welds in line pipe. Investigations are now being carried on to determine the applicability of the method to the inspection of field welds of line pipe.

CORROSIVE ENVIRONMENTS *and* METHODS OF MITIGATION

. . . *in producing sour crude*

by D. A. Shock* and J. D. Sudbury*

AS a starting basis for considering sour-crude corrosion, it seems highly desirable to stress the point that there are several different types of corrosive environments which occur during the production and subsequent handling of the crude. While workers actively engaged in corrosion work recognize these different environments as being present, there is a general tendency to classify all sour-crude corrosion as sulfide corrosion with no reference to the particular environment in which the corrosion originated. As a consequence, remedial measures are often misapplied due to the fact that these differences are not recognized. Certainly, these various environments must be recognized in any fundamental study of the corrosion mechanisms.

While it is possible that more divisions could be made, the following seem to be the most basic:

1. **The well environment** exists where the total produced fluids contact the equipment usually at fairly high velocities.
2. **The aqueous environment** exists where the water has separated from the oil.
3. **The hydrocarbon environment** exists where the crude exists above.
4. **The vapor environment** exists where the vapor in the vapor space above the crude or where the gas has separated from the other produced fluids.

Well Environment

The well environment is probably subject to more variables and is the least consistent in comparative behavior than any of the others we are to consider. This is due to the fact that very little is known about the factors which are important in influencing rates of corrosion so that correlations of behavior are made between systems which are fundamentally unlike. Thus, the data which are essential to judge the corrosive character of a certain well system are never taken because we do not recognize it as necessary.

From the work done on sour crude and particularly the fundamental research which has been done on corrosive sweet crudes and condensate wells, we can outline some of the factors which would influence the corrosive character of the well environment.

It has been well established that the presence of water is necessary for corrosive attack to take place. While H_2S is commonly thought of as the only corrodent to be in sour crude, we now know that there is sufficient CO_2 present in many sour-crude wells to produce a severely corrosive environment.

Recently, our laboratory has found that the lower fatty acids, such as acetic, are found in many produced waters of corrosive sweet crudes; therefore, we should not overlook the possibility that other corrodents than H_2S can influence the severity of corrosion. Oxygen has been shown to accelerate corrosion if it is introduced into a well; however, this condition is not usually encountered unless a well is being pumped under vacuum. Oxygen has not been found in well constituents which are uncontaminated by air.

With corrodents which are gases such as H_2S and CO_2 and where the corrosive action is dependent on their being dissolved in water, the concentration of corrodent depends on the solubility of those gases in the water. This means that the solubility is greater with a decrease in temperature and increases with the increase of the partial pressure of the gas. Thus, the two factors which affect the concentration of corrodents H_2S and H_2CO_3 in a well work against each other.

Temperature drop increases solubility and the pressure drop decreases solubility. It also follows that from well to well, where there is pressure and concentration variation of gas, it is possible to have a wide range in corrodent concentration. It is important, therefore, to know the operating temperatures and pressures as well as the corrosive gas content if corrosive situations are to be compared.

In addition to the concentration of corrodent, there are other factors which are known to influence the rate of attack in well systems. Rogers[3] has shown that using the same corrosive conditions, the corrosion rate decreases as the oil increases. Thus, wells producing a high oil-to-water ratio are very slightly corrosive compared to those producing under the same conditions but with a low oil-to-water ratio. Another factor is the buffering action and solubility limitation due to dissolved salts which can have a retarding action on the rate of attack.

Additions of neutralizing and buffering compounds are now common means of mitigating corrosion in condensate wells. On the other hand, it is possible that some salts may accelerate well environment corrosion. This, however, has not been established as any major effect. Velocity of produced fluids has two effects. The one of major importance is the effect of moving more corrodent across the metal surface; the other is the erosion effect which removes any protective or semiprotective layers that may have formed on the metal surface. Both of these accelerate the rate.

Associated with the corrosion which takes place are the phenomena of hydrogen embrittlement and blistering. These phenomena are peculiar to the production of sour crude and are responsible for a large part of the corrosion costs. Both embrittlement and blistering are believed to be caused by the production of atomic hydrogen produced by the corrosive reaction. In the case of embrittlement, the atomic hydrogen is absorbed in the steel in such a manner that the metal breaks under stress. With blistering, the hydrogen penetrates through the metal until stopped by a barrier or encounters a void, then the atomic hydrogen unites to become molecular hydrogen. The pressure of the molecular hydrogen builds up and disrupts the metal, usually forming blisters, but sometimes completely breaking out a piece of metal.

In some of the earliest work on sour crude, Vollmer and Westcott[2] showed that water and well brine saturated with H_2S would embrittle drilling lines. The effect of atomic hydrogen from sour-crude corrosion is similar to the same phenomena resulting from

*Continental Oil Co., Ponca City, Okla. Presented at spring meeting, A.P.I. Division of Production, Casper, Wyo.

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the action of the strongest acids on steel such as in the pickling of steel and in hydrofluoric acid alkalination. Including the work done on the stronger acids, considerable work has been done on the effect of atomic hydrogen. Nevertheless, the information on the factors which promote or inhibit the hydrogen formation and diffusion is still not well understood. A better understanding of the metallurgical requirements for a steel which would resist embrittlement need continued investigation.[4,5,6,7,8,9]

Types of Corrosion and Remedial Measures

The appearance of the corrosion taking place in the well environment is generally a pit attack. This occurs on tubing, sucker rods, and line pipe. Failures due to embrittlement usually come when the metal has been under stress as in sucker rods and parts of pumps. Mitigation methods are aimed at stopping the corrosion, which if it is accomplished, stops the effects of any produced atomic hydrogen.

We have three general classes of mitigation methods. First are the alloys, second the coatings, and third the inhibitors. The alloys which are serviceable are those of high alloying constituents and generally too expensive to be used in any except the most severe service. K monel, Inconel, and various types of high-chromium nickel steels resist attack and embrittlement but are too expensive to be used in tubing. Some use of K monel is made in sucker rods, but usually lower first cost methods are favored. The field of coatings is more widely used, both organic and inorganic. All coatings suffer from the disadvantage that, after the coating has been penetrated, attack and ultimate failure will take place. Thus, success in most cases depends on the length of time they adhere to the basic metal as a continuous protective film.

Various plastic-coated tube and sucker rods are available. Sprayed and dipped metal coatings such as monel and zinc galvanizing have shown some corrosion-resistant properties. Tubing has been cement lined by a centrifugal process which has been in use for several years by one of the sulfur companies under conditions much more severe than sour-crude production. Line pipe is now being produced by the same method; however, no performance data have been received. Surface lines are also being given a continuous rubber lining which seems to give a good performance. Inhibitors thus far developed which are in service have been formaldehyde,[10] the Kontol inhibitors made by Tretolite Co., and wetting agents to give continuous oil films as described by Rogers.[2]

Corrosion in Heaters and Treaters

The well environment was extended to include the various types of emulsion-breaking systems. These may justify another environment class for they employ heat, the produced fluids become separated, and the well fluids may have had a primary separation stage. It is evident that the corrosion performance of the various types and locations of separation equipment should not be compared unless it is known that the environments are the same. The potential corrodents are the same as those mentioned under the well environment.

Heat increases the reaction rate of the corrodents. Not only are these corrodents more aggressive, but also the sulfur compounds in the petroleum become corrosive if sufficient temperature is reached.[11] Alloys, thus far, are the best solution in stopping corrosion though expensive in first cost. An inexpensive method has not been found. Various coatings have been tried as well as cathodic protection methods; however, there are no published data on the comparative effectiveness of mitigation methods.

Water, Oil, and Gas Environments

The remaining three environments and their mitigation methods are best discussed together. These environments, while occurring separately in other places through the production system, are responsible for a large portion of field corrosion as they occur together in the lease and storage tanks. Therefore, they will be discussed together with principal stress on how they occur in storage tanks.

Water-zone environment.—The corrosive reactions in the water environment are those which are due not only to active corrosive agents H_2S, H_2CO_3, etc., but also galvanic and possibly concentration cell corrosion. With a large excess of H_2S present, there is no evidence that there is also dissolved oxygen present; however, if oxygen enters the system, a precipitate of sulfur is formed thus producing another corrodent.

Formation of the oxygenated sulfur acids H_2SO_4 and H_2SO_3 has been postulated as another corrosive agent but not definitely proved. Under these conditions, corrosive attack can proceed along a number of different paths. It is possible to have galvanic corrosion take place due to particles of scale which have fallen from the roof or have been produced at the bottom and flaked off. It readily can be seen that no single simple corrosive reaction can be written which will show how corrosion progresses in this zone. Successful mitigation methods must eliminate the effect of all these various corrosive reactions.

Oil-zone environment.—The oil-zone environment is the least corrosive of any of those we are to consider. There is good evidence to show that the major portion of this corrosion is due to H_2S dissolved in water emulsified in water in the oil. Sheppard[12] cites results obtained by Walter F. Rogers showing H_2S contents in oil as low as 0.1 per cent by weight would promote rapid corrosion in pipe-line oil.

While penetration rates in the oil zone are comparatively low, hydrogen blistering is quite prevalent. In order to produce the hydrogen for this blistering to take place, some corrosion must take place. Information is badly needed which would better define the conditions which produce hydrogen blistering in the oil environment.

Vapor environment.—The corrosion taking place in the vapor space is probably the most troublesome of the zones in storage tanks. Here a number of corrosive reactions can take place; and, while the work of Devine, Wilhelm, and Schmidt[1] and Bond and Marsh[13] have laid some excellent ground work in a study of the corrosive reactions, much needs to be done to further the knowledge.

Oxygen, water, hydrogen sulfide, and sulfur combine to give the corrosive environment. The corrosive reactions take place principally in the condensed droplets on the dampened surface. Hydrogen sulfide from the vapor space dissolves in the droplets of water and sulfide attack occurs. Oxygen can react with the dissolved H_2S producing S. Oxygen also unites directly with the iron in the moist atmosphere and produced hydrous oxides. These iron oxides react with either H_2S or fairly divided sulfur producing further attack.

The corrosion products of the oxides, sulfide, and free sulfur are all nonprotective and usually porous so that no protection is afforded by their formation. Instead, they tend to hold the condensed moisture stimulating further corrosion. It has been shown also that the variation in H_2S and oxygen content varies the rate of attack and corrosion product formed.

The reports of research[1,13] have given some basis on which to predict corrosive behavior on the basis of physical conditions and chemical analysis. As such, they are a step in the right direction in placing corrosion predictions on a sounder basis and give a better starting point in evaluating mitigation methods.

Mitigation Methods

There has not yet been developed a method which satisfactorily combats the three types of corrosive environments found in storage tanks. The mitigation methods are often different for each corrosive zone. The principal methods are discussed below.

Coatings.—The coating materials come nearest to achieving a single mitigation method. Various formulations of the plastic paints show some promise; however, they lack much in being completely successful. Hydrocarbon permeability, poor adhesion, inability to withstand mechanical shock, and cost of application are all factors which keep the plastic coatings to date only partially satisfac-

Low-cost, flexible insulating joint is simple to install

Where it is desirable to sectionalize a main for the application of electrolytic protection—or wherever insulating joints are indicated—Dresser Insulating Couplings, Style 39, provide ultimate protection at lower cost. There is no exact pipe fitting required and the joint itself costs but a fraction of the cost of more cumbersome insulating methods.

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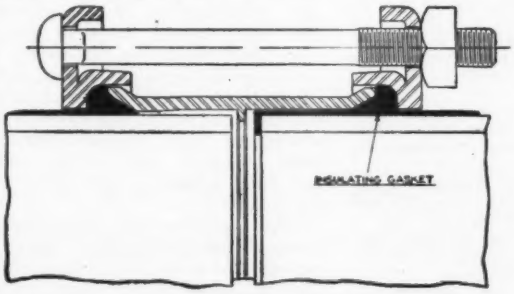

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tory. The bitumen and asphalt-base paints are very successful when properly applied on the bottoms of tanks protecting water zone corrosion. They are less so on the sides and deck due to their plastic flow and solubility. These coatings seem to have definite advantages over the newer types of plastic and for the tank bottoms.

Inorganic coatings such as galvanizing have given good service in numerous corrosive areas, particularly in the vapor zone and oil zone as well as exterior. The failures seem to come mostly in the water zone where the salt water attacks the zinc rapidly and, when the zinc is removed, corrosion of the steel takes place.

From work on tubing sulfur wells, it was found that the addition of small amounts of Mg and Al to zinc gave a galvanizing coating which was much more resistant to salt water and sulfur corrosion than ordinary zinc galvanizing.[14] This alloy galvanizing may prove of use in such salt-water service. Cement lining has given good service in all three zones. Here again cost puts an economic limitation on its widespread use.

Metal alloys and design.—Aluminum has been found to have excellent resistance to vapor-space corrosion, but it has poor resistance to the water environment. Its use for decks and rings in combination with other types of corrosion-resisting methods for the other two zones has given a means of combating tank corrosion. Cone-bottom tanks, which have a slight taper and a center sump for water collection reduces the area covered by the water environment. The center sump in which the water collects is made of monel to resist the water-zone corrosion. A combination aluminum deck, cone bottom, and monel sump has recently been put on the market combining these features.

Vapor-space inhibitors.—Gardner, Clothier, and Coryell have described the use of ammonia for corrosion control in the vapor space.[15] They show that a concentration as low as 0.4 per cent of ammonia can stifle the corrosion of 2 per cent H_2S gas mixtures. Checking this work in our laboratory, we have concluded that the protection afforded is due to the rise of the pH in the condensed water droplets.

Ammonia is considerably more soluble than H_2S so that very little of the ammonia is required in the vapor phase in order to neutralize the dissolved H_2S in water droplets on the side of the tank and bring the pH of the solution to a value such that the corrosion of iron either by sulfide or by oxygen proceeds at a very slow rate. While ammonia is not a true inhibitor, its present use suggests the possibility that vapor-zone inhibitors could be developed which could be applied in a similar manner.

Minimizing corrosion by operating practices.—Since it is evident that oxygen greatly accelerates corrosion,[13] it is logical to assume that the life of a tank could be lengthened by excluding it. We have several tanks now under test which maintain a natural gas atmosphere in draw down and no air is pulled into the tank.

Another measure, as shown from results on coupons placed inside a sour-crude storage tank, indicates that occasional wetting of the steel in the vapor space with crude reduces the rate of attack. Spray systems which were supposed to spray the crude over the top have not been entirely successful in the field. These field difficulties have in some cases been due to the spray not thoroughly wetting the entire surface.

As the final point, it should be kept in mind that any method of removing or reducing the concentration of the corrodents or the medium in which they are active (water) will result in a decreased rate of corrosion. Thus, completely removing or excluding liquid water and neutralizing or fixing the sulfide should be beneficial.

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Reduced Crude Decarbonization

(Continued from page 56)

at the refinery include an administration building equipped with radiant floor heating, a laboratory to be used for control work and development research, and a stores and shops center in which maintenance and supply functions are organized for maximum efficiency and economy.

Steam-generating capacity has been increased by addition of a water softener to serve existing boilers and the cat cracker as well as a new boiler of 75,000 lb. per hour rating. Auxiliary additions, including a 50-kw. turboelectric generator to maintain all instruments and a few essential lights in operation in event of electrical power interruptions, are grouped with the old auxiliaries in an extension to the boilerhouse building. The new boiler, designed and built by Dominion Bridge Co., is installed in the open, suitably insulated and weatherproofed, with housing limited to an enclosure at the firing platform end and sheeting over some open sections adjacent to the original boilerhouse for operators' protection.

Tank-car loading for all white products has been relocated on the north side of the plant area and existing loading racks on the south side now handle only asphalts and fuel oils. A new railroad spur was also laid down the refinery's main roadway to provide easier delivery of equipment and bulk supplies to maintenance shops and stores. Locker, washroom, and cafeteria facilities have been enlarged and further capacity has been added to the ethyl blending plant.

Plant utilities were completely revamped and modernized. Distribution systems for electricity, steam, air, gas, fuel oil, and water were relocated and expanded where necessary. The expanded cooling water system which formerly used St. Lawrence River water on a once-through basis, has been converted to closed circulation over a cooling tower. Cost of the tower and auxiliaries was found to be less than that of expanded river supply and sewer lines. Existing river lines will provide adequate water makeup.

Tank storage represents a major item of plant cost at Montreal, where water transportation of crude and products is closed during 5 months of the year. Although some crude deliveries are made through the Portland-Montreal pipe line during winter, sustained crude runs must come mostly from storage until water transportation resumes in the spring. Product storage demands are also high. While motor fuels move slowly in winter months, the heavy summer demand in eastern Canada requires heavy runs to storage at the refinery until resumption of river transpor-

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IN POINTE A LA HACHE FIELD
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13

Mud (Baroid):
R_m = 0.92 ohms at BHT
Bit Size: 9⅞"
Spacings: AM = 16"
AM' = 64"
AO = 19'

LOG ANALYSIS

1) Water saturation S

R_o = 0.8 ohm in water sand around B level

The value of 20 ohms given in level A by both the 16" and 64" Normal when corrected will result in R_t = 27 ohms approx.

In level A $S = \sqrt{\frac{0.8}{27}} = 17\%$ approx.

2) Formation water resistivity R_w

$SP = -90 \log_{10} \frac{R_m}{R_w} = -96$ mv.,

thus, R_w = 0.08 ohm BHT

3) Porosity p

$F = \frac{R_o}{R_w} = \frac{0.8}{0.08} = 10$

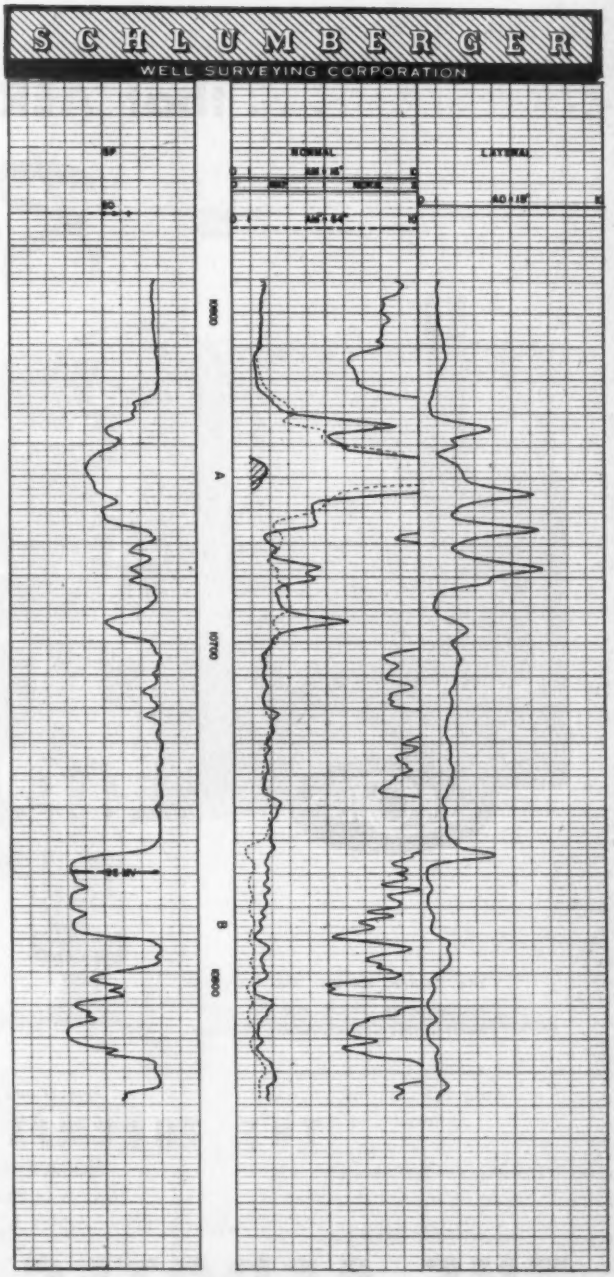
$p = \sqrt[m]{\frac{1}{F}} = 28\%$ for m = 1.8

CORE ANALYSIS

Porosity	26 to 34%
Permeability	1800 md.

PRODUCTION RESULTS

Perforated	10,669-80 and 10,689-93 with 24 shots
Potential	240 BOPD, 34° API Gas oil ratio 675/1



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This pilot installation at Alice, Texas, used on very dry gas, was first installed on the discharge of a conventional type gas scrubber (position of first installation shown by arrows). In 18 hours of operation, this Aerotec unit collected 2 quarts of liquid, from gas that had passed through the conventional unit.

Installed at the inlet to the conventional gas scrubber, only one teacup of fluid was collected from the conventional type in 8 days, and this was probably condensation.

This is a typical example of field reports on the high efficiency of Aerotec gas scrubber units. Based on a modification of the principle of separation used in dust collection, Aerotec units have produced outstanding results, both at the well and on pipeline applications.

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tation again allows normal distribution. Expansion of operations at the British American refinery called for addition of 1,784,000 bbl. of crude and product storage, giving the plant a total storage capacity of 4,138,000 bbl.

Toulouse-Bordeaux Pipe-Line System

(Continued from page 63)

who had made this type of joint a specialty. Each of them welded only one bead. The pipe was lined up by clamps. The first and second beads were welded with ⅛-in. electrode; the third one with ⅞-in. electrode. The average actual welding time was 28 minutes 35 seconds per joint; about 2 lb. of welding rods were used for each joint.

No X-ray tests were made on the welded joints, dut to the fact that no equipment was available in France for this purpose. The welders were first submitted to agreement tests by R.A.P. control service. Each welded joint which seemed to be defective was cut off and welded again. From time to time, and for each welder, a joint was sampled and analyzed.

Some 250 such samples were analyzed, representing 0.83 per cent of the total number of joints; in addition, 200 defective joints (0.66 per cent) had to be welded again.

Ditching.—The ditch, 3 ft. deep, was dug by eight ditching machines, including one Cleveland, six Barber-Green, and one Parsons.

Numerous rocky areas had to be blasted or dug with air-compressor equipment. In addition, within city limits, the ditch was dug by hand, due to the numerous impediments (cables and pipes) found in the underground.

Coating.—The pipe was coated with hot coal-tar enamel and wrapped with glass fiber. This coating and wrapping were applied in "rolling" installations at the pipe-manufacturing plant (30 per cent) or at field installations erected near the railroad stations where the pipe was received.

Testing.—The welded joints were air-tested at 100 psi., then coated and wrapped with the same products used for the pipe itself.

Before the pipe was laid down into the ditch, the coating was tested with high voltage detectors, designed and built by R.A.P.; if necessary, the coating was repaired until the test was satisfactory.

Two sections of the line, 17 miles altogether, within the city limits of Toulouse and Bordeaux, were hydraulically tested at 1,250 psi., after being laid down. The other sections were tested with gas at 50 psi. above the maximum working pressure of the line, according to A.S.M.E. standards for gas and air piping.

A go-devil was run through the line with gas pressure, by sections of 10 to 20 miles at a time.

Gas deliveries.—The gas started to flow on March 1, 1949. The deliveries through the line are now of about 3 million cubic feet per day. It is expected that within 2 years, the market will increase to 5 million cubic feet.

The natural gas is mainly used for city gas replacement in the towns of Montauban, Castelsarrasin, Moissac, Valence d'Agen, Agen, Langon, and Bordeaux. It is burned for furnace or boiler heating in two plants located respectively in Castelsarrasin and Casteljaloux. Six compressor stations have been built in Montauban, Agen, Langon, and Bordeaux to compress at 3,000 psi. the gas to be used as motor-fuel gas. Cost of compressed gas for the same mileage is about half the gasoline price. These economic conditions still make this fuel attractive for the customers, although gasoline is now freely sold in France.

This pipe line is the last development of the present program until new discoveries would be made in southern France where extensive drilling is carried on and where numerous seepages of oil and gas have been known.

However, Saint-Marcet field is by itself a substantial discovery since it is equivalent to a coal mine of 9,000,000 tons.

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Improved TECHNIQUE for TANK INSULATION

Above: 140° Bunker "C" storage tank completely waterproofed and protected for the life of the tank. At plant of Boulevard Fuel Oil Co., Bogota, N. J. Right: Welding channel sections to sides of the tank. The furring lugs insure a sound welding contact and overcome radiation through the channel sections. Photo at Shell's Sewaren, N. J., plant.

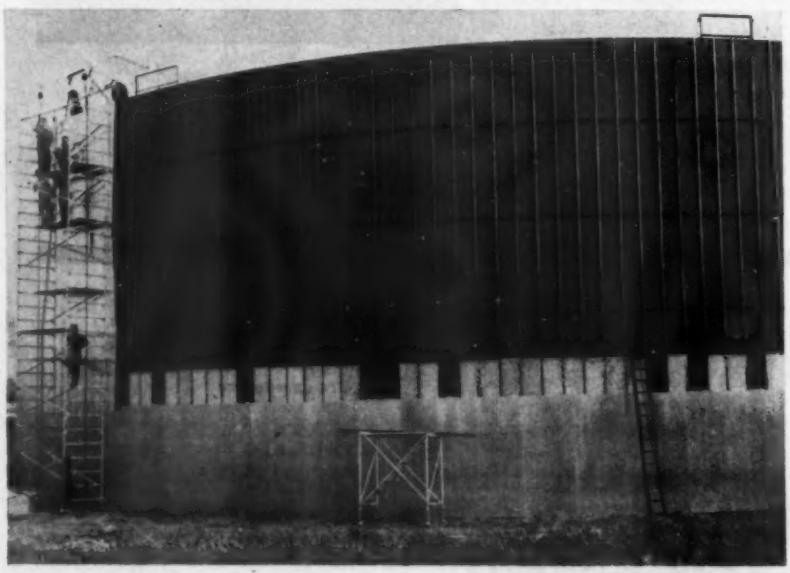
A NEW three-step technique for insulating tanks, stills, and kettles, developed during the past year by Nicholson & Galloway, New York, covers the perishable, normally exposed surface with any one of a number of insulation materials, then permanently protects it with a metal armor cladding of corrugated aluminum. The technique was developed to overcome the undesirable characteristics of conventional tank insulation.

The major problem has been to prevent outside moisture from penetration to the tank surface through shrinkage cracks in the exterior coating. These apertures occur through shrinkage slumping, sagging, and shredding of the insulation material, frequently as a result of rupturing of the metal band construction due to unequal expansion.

Early study of the conventional method and its weaknesses favored the sheet-metal worker's approach toward rugged rigidity and positive proof against moisture penetration. It was accepted that almost any of the insulating blanket or block materials possessed the equivalent "K" factor for the temperature range under consideration.

Fiberglas with a normal coefficient of .30 B.t.u. has been frequently used because it is completely fire resistant, has attractive price range, and the lightweight blanket material is easily applied and has sufficient flexibility to conform to tank contour.

Typical assembly procedure. Horizontal shell angles will prevent the insulating material from slumping. (Shell, Sewaren, N. J.)



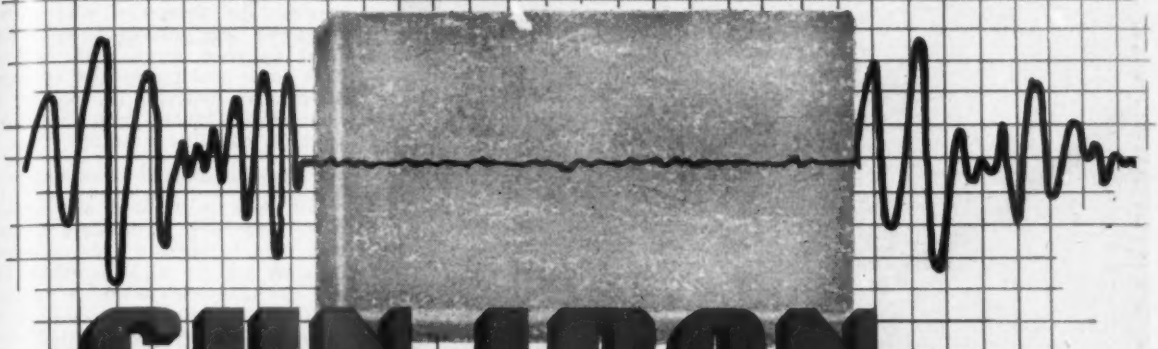
Importance of Roof Insulation

Preliminary steam flow-meter tests showed that the insulation of the tank-roof surface is almost as important as side-wall insulation. In other words, the loss of heat through the roof area can be almost as great as through the side walls. Therefore, the Nicholson-Galloway method first lays down 1½-in. roofing Fiberglas and then mops down layers of 30 and 40-lb. felts by cold-profess asphalt. Around the periphery of the tank-roof structure, a sheet metal gravel-stop flashing integrates roof and side wall and helps to make the insulation of both enduringly waterproof.

First Step of Technique

The side-wall surface of the tank is divided into areas bounded vertically by hollow metal channel sections of 18-gage steel, and horizontally by shelf angles. The channel sections are rigidly welded to the tank walls throughout their height,

To damp vibration . . .



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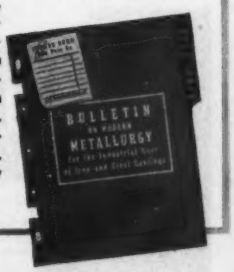

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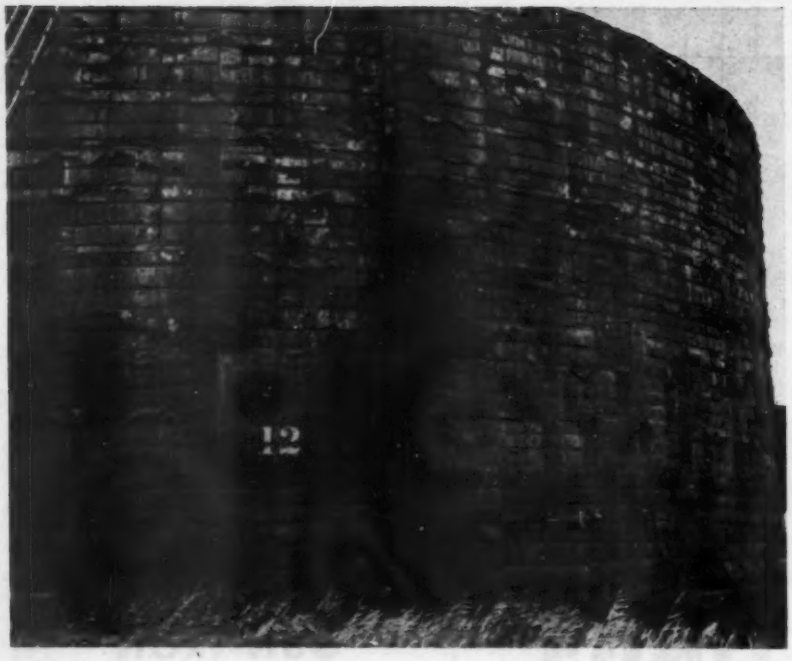


and the shelf angles welded between channel sections.

To minimize thermal conductivity throughout the channels, heavy-gage bar stock furs them out away from the tank surface. This bar stock also insures a sound welding surface against a tank structure often covered with mill scale or multiple coats of paint.

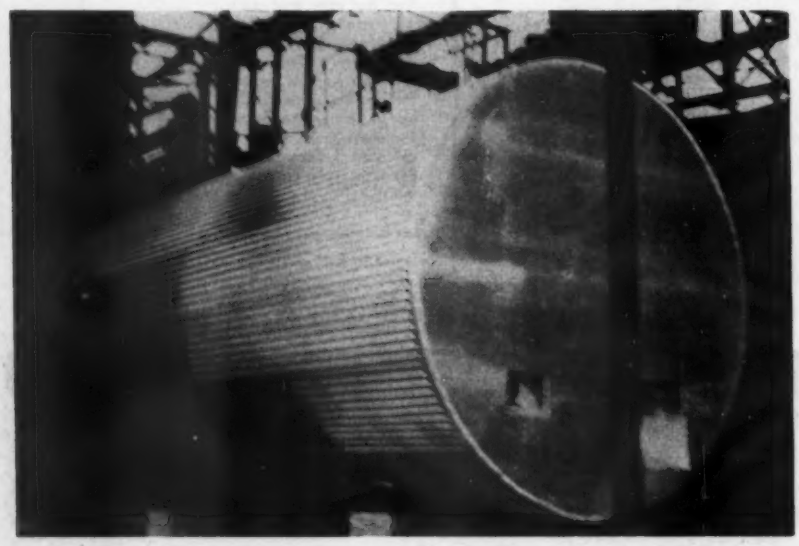
Second step.—Now the Fiberglas insulating blankets are placed against the bare tank walls and snugly tucked between the channel sections. They cannot sag because of the shelf angles. It is possible also, on hot surfaces, to use 85 per cent magnesia, Foamglas and Rock wool. In low-lying areas particularly, a 12-in. base course of 2-in. Foamglas is used, this material being impervious to moisture.

Final step.—To protect insulation for the life of the tank, sheets of .024 corrugated aluminum are applied vertically and secured to the channel sections with specially designed drive screws. An aluminum washer with neoprene seal insures a water-tight joint between screw and cladding. This outer armor may also be asbestos-cement material or any of the noncorrosive metals such as stainless steel, as conditions require.

Time Required for Installation

For work on the tank side walls, a new suspended scaffolding permits four men to operate over an area 8 ft. wide and up to 50 ft. high. This scaffolding, constructed on tubular aluminum, weighs about 500 lb. It can be jacked free of grade contact when changing position and travels freely around the tank.

This new technique of application, plus the speed achieved by skilled workmen, have permitted Nicholson & Galloway to complete more than 1,000 sq. ft. of tank insulation in a day. When it is considered that the conventional 85 per cent magnesia insulation, coated with asphalt and secured with steel bands, formerly cost up to $2 per foot and frequently needed replacement within 5 to 10 years, the technique is remarkably low cost. Currently it runs less than $1 per square foot for side walls and roof.



Above: A failure, for some insulation blocks. Unequal expansion and contraction caused rupture of metal bands. Then moisture penetration through the top and sides resulted in slumping and shredding of this insulation mass, only 7 years old. Right: Roll-around scaffolding. Insulation material and protective cladding are installed quickly and efficiently by means of this light, transportable scaffolding equipment. Photo at Sewaren, N. J., plant of Shell Oil Co. Below: Insulation 6 in. thick and rugged .032 aluminum cladding have thoroughly waterproofed this tank at high operating temperatures. Photo at plant of Barrett Tarvia Division, Allied Chemical & Dye Corp., Syracuse.

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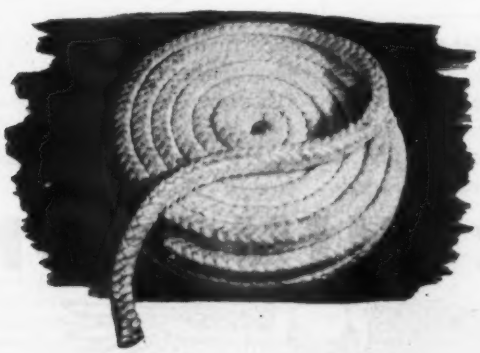

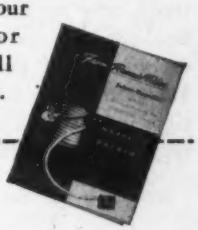

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OG-6

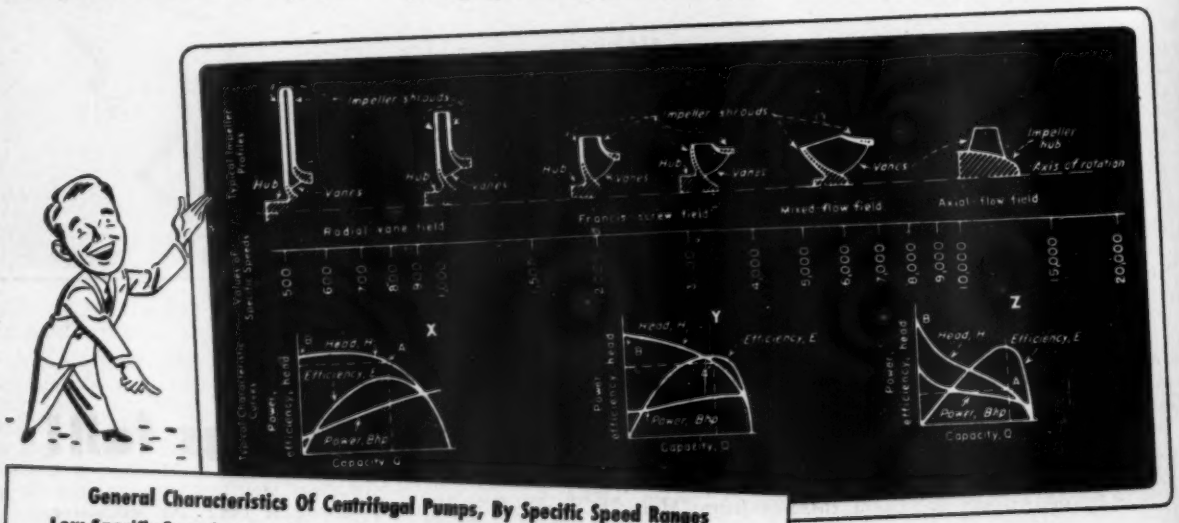
XUM

Pointers on Pumps

How Do Head, Capacity and Speed Affect Centrifugal Pump Design?

The head, capacity and speed for which a particular centrifugal pump is designed determine its "Specific Speed." Pumps having the same "Specific Speed" will have like proportions and characteristic curves.

The illustration shows several typical pump-impeller profiles, ranging from the low specific speed radial flow on the left to the high specific speed propeller design on the right, each design being placed in its proper position with relation to the specific speed scale. Below the scale, characteristic curves X, Y and Z indicate the hydraulic characteristics of three pumps, each designed for a specific speed corresponding to its position on the specific speed scale.



General Characteristics Of Centrifugal Pumps, By Specific Speed Ranges

Low Specific Speed — Diagram X

- Small rise in head from point of maximum efficiency "A" to shut-off "B".
- Wide capacity range at high efficiency.
- Rapid decrease in bhp from point of efficiency "A" to shut-off "B".

Medium Specific Speed — Diagram Y

- Steeper rise in head from "A" to "B".
- Moderate capacity range at high efficiency.
- Nearly constant bhp from "A" to "B".

High Specific Speed — Diagram Z

- Very steep rise in head from "A" to "B".
- Narrow capacity range at high efficiency.
- Rapid increase in bhp from "A" to "B".

These basic characteristics may be modified to obtain certain desirable features. For example, although boiler feed pumps have low specific speed, they require a steadily rising head-capacity curve — not one that droops toward shut-off, as shown. There can be any number of pump designs in-between and beyond the few typical ones illustrated here.

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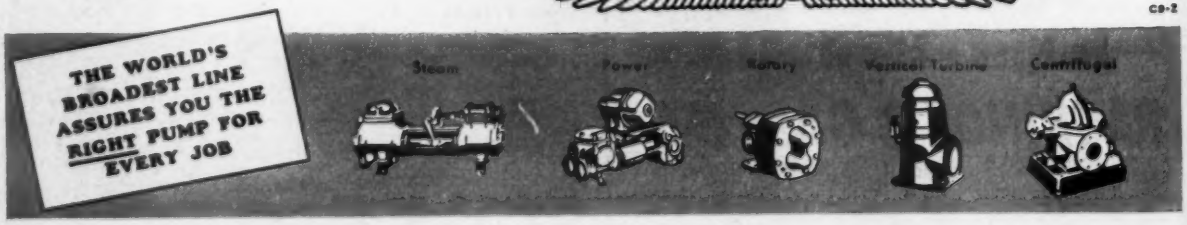

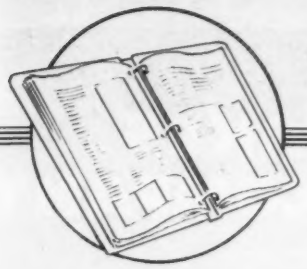

THE REFINER'S notebook

Butterfly Valves and Dampers

FOR certain applications, as in a combustion control system, the final element may take the form of a butterfly valve or damper. Dampers of varying construction are available for both rectangular and round ducts, including flat (thin) blade and streamlined or lens-shaped disks or vanes, radial multivane dampers and louvers consisting of several rectangular blades.

Application.—Butterfly valves are usually employed for regulating large flows at low pressure drop. They are available in large sizes for regulating flow of gas or air in ducts. In some applications they are used to regulate flow of viscous liquids. Other applications are in control of condenser cooling water in large quantities at low pressure and sometimes for regulating the flow of vapor in fractionator overhead lines when minimum operating pressure is employed. Pressure reduction; liquid-level control; and throttling control for fans, blowers, pumps, and turbines are still other applications for this special form of control valve.

A common type of butterfly valve is one in which the vane moves through 90° from closed to open, but valves with a 60°-closing angle are also standard. In addition there are so-called "wobble" valves, i.e., with eccentric mounting. A "wafer" type of butterfly valve is shown in Fig. 1. Butterfly valves may be used at operating temperatures up to 800°-900° F.

Dampers

Flow characteristics of various types of dampers are reported by Dickey and Coplen (A.S.M.E. Transactions, 1942, p. 137). The damper characteristics are presented in the form of curves, at different values of the total system resistance, relating damper opening to (1) per cent of maximum flow, and (2) damper resistance as per cent of total system resistance.

Flow characteristics.—Damper characteristics are altered by change in pressure drop but are not affected by change in flow at constant pressure drop. For this reason, per cent of maximum flow at a given damper opening is determined as a function of pressure drop across the damper relative to total pressure drop in the system. Dickey and Coplen recommend that pressure drop through the damper be determined at openings of between 20° to 40°. (This is equivalent to taking about 55 to 60 per cent of total system drop across the damper at 30° opening). Note that no attempt is made to obtain the "ideal" or linear characteristic in dampers. Usually good control may be obtained with different types of dampers provided close attention is paid to sizing. The tendency, generally, is to oversize butterfly valves and dampers with consequent detrimental effect on the flow characteristics and control action. A numerical example for damper sizing is given by Dickey and Coplen.

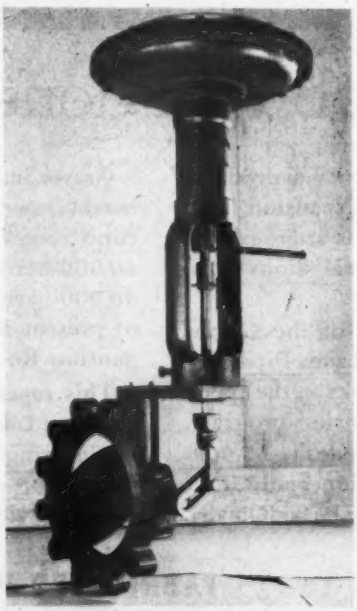

Fig. 1—Butterfly valve of "wafer" type.

Leakage in dampers.—As with control valves, leakage may be important in certain applications. For tight shutoff, dampers with side stops or sealing strips are used. For higher operating temperatures added clearance must be provided. Other factors important in the construction of dampers are design of linkage as related to effect on flow characteristics and calculation of torque required to position the damper.

Butterfly Valves

In the past, sizing of butterfly valves was often done in an arbitrary manner and torque requirements were initially underestimated for many installations. Presently manufacturers of these valves have developed charts and rules for more precise determination of flow, torque and thrust in most applications. Butterfly valves may be employed in two types of installations: (1) where downstream pressure is positive, and (2) where the downstream pressure is atmospheric or negative (as for a butterfly relief valve). In the one case only the pressure drop through the valve need be considered (changes in velocity head are relatively small and may be neglected). In the other case the pressure drop must include change in upstream velocity head.

Flow coefficient.—Comparison of published data for flow through butterfly valves has been made by Dushkes (Preprint of paper presented at annual meeting of the A.S.M.E., 1946).

Flow characteristics are compared in terms of flow coefficient as a function of angle of opening. This, in general, provides a basis for the preparation of sizing, charts, relating flow rate and nominal valve diameter to pressure drop and valve opening.

Similarly, equations may be developed defining a torque coefficient and thrust coefficient in terms of valve diameter, pressure drop, and angle of opening.

No. 23 in current series. The Refiner's Notebook has been published continuously since 1944

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Permeability Capacity Distribution

IN previous numbers of this series the distribution of permeability has been discussed. In using permeability for flow computations it is necessary to consider total permeability capacity rather than permeability. The permability capacity measures the importance of a given permeability in its contribution to total flow. Some aspects of showing this distribtion will be discussed.

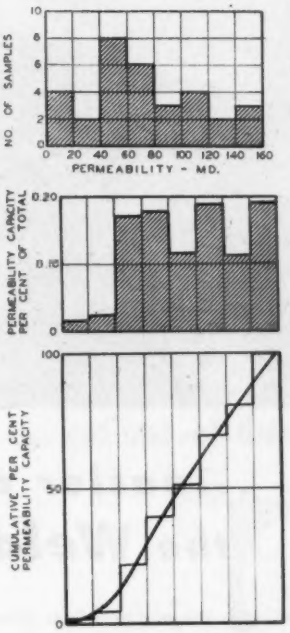
Permeability capacity is the product of the permeability and the footage of formation having that permeability. Without any additional knowledge, it is improper to say that the permeability of a given sample in a core represents any footage other than that of the sample itself. Therefore, in the following discussion each sample is taken to represent a unit of thickness.

A distribution curve on permeability can be converted to a permeability capacity distribution, if permeability capacity is taken as a measure of frequency, by multiplying each permeability frequency by the permeability. Figs. 1A and 2A are permeability distribution curves (refer to Engineering Fundamentals No. 404) and Figs. 1B and 2B are the corresponding capacity distribution curves. The y axes in Figs. 1B and 2B read per cent of total permeability capacity rather than absolute permeability capacity. This gives it a frequency designation. To calculate Figs. 1B and 2B each bar of the histograms in Figs. 1A and 2A was multiplied by its corresponding average permeability and the product divided by the sum total of all such products.

In the B figures the peaks are shifted to a higher permeability than shown in the A figures. This will always be the case.

In Fig. 2, for example, 7 out of a total of 42 samples, 16.7 per cent, had a permeability less than 20 md. From a capacity standpoint, however, these samples represent less than 4 per cent of the total. In the cored well represented by Fig. 1 those permeabilities less than 40 md. represented less than 5 per cent of the total flow capacity.

Figs. 1B and 2B can also be shown as cumulative capacity versus permeability. This is given in Figs. 1C and 2C. It is immaterial whether the cumulative capacity be measured from the high or the low permeability as a starting point. This particular type curve is analogous to the cumulative frequency curve for permeability which was discussed in Engineering Fundamentals No. 405.



Figs. 2A (top), 2B (center), and 2C (bottom).

If cumulative capacity be plotted versus permeability starting from the high values of permeability, one can easily determine the lower limit of permeability that need be considered in evaluation problems where low permeability values are generally ignored. Fig. 3 shows such a plot for data from Reference 3. In this particular plot the capacity data were computed point by point rather than in intervals as shown in Figs. 1 and 2. In this example (Fig. 3) only 2½ per cent of the capacity is ignored by eliminating everything below 48 md.

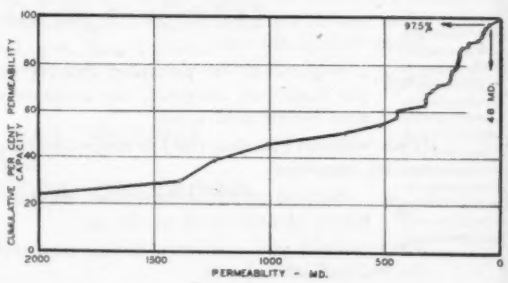
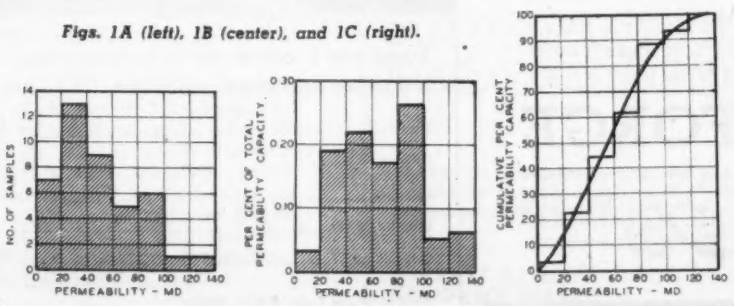


Fig. 3

Figs. 1A (left), 1B (center), and 1C (right).



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1. U.S.B.M. RI 3715, p. 84.
2. U.S.B.M. RI 4019, p. 30.
3. University of Oklahoma, M.S. Thesis, Frank Folger, 1949.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

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...easier and better the WeldELL way

For the *practical* facts about pipe welding fittings go to the *practical* men...the welding foreman; the pipe fitter foreman; the construction superintendent... who have used all kinds and know the field.

They will tell you that the job moves faster and costs stay down when WeldELLS and other Taylor Forge fittings are used

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...because of the completeness of the line and better identification markings.

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OIL AND GAS EQUIPMENT Digest

IT'S NEW — CHECK IT

TRADE LITERATURE

1 INDUSTRIAL CONTROL DEVICES for temperature flow, pressure, liquid level, and humidity are featured in Catalog 8303 This 64-page catalog presents over 100 different models of nonindicating electric, electronic, and pneumatic controllers. *Minneapolis-Honeywell Regulator Co.*

REPUBLIC ELECTRIC WELD PIPE. A new 20-page booklet on pipe made by the electric resistance weld method contains a detailed description of the manufacturing process, outlined step by step. The center spread shows the sequence of operations in chart form. Ten reasons why Republic electric weld pipe is superior product are given, as well as essential tables of weights, dimensions, and hydrostatic test pressures. *Republic Steel Corp.*

3 CLIPPER SEAL is a 16-page handbook of useful data on oil seals. Photographs show where to use Clipper Seals and how to install them. Drawings illustrate how the lip and heel construction of these nonmetallic oil seals can be varied. *Johns-Manville.*

4 CONTROL CONNECTING LINKAGE, a 16-page brochure contains all information necessary for choosing and ordering the correct control connecting linkage to suit almost any application. *Bailey Meter Co.*

5 INDUSTRIAL COATED FABRICS, details a wide range of coated fabrics. The highly versatile list shows detailed specifications, including 10 variations under premier coatings. *Vulcan Proofing Co.*

6 FIRE-HAZARD INDEX, pocket-sized, 36-page book lists, in quick-reference alphabetical order, over 590 chemical, gas, and common fire-hazard materials and specifies which type of fire-fighting agent to use on each, as recommended by the Board of Fire Underwriters and the National Fire Protection Association. *Randolph Laboratories, Inc.*

7 INDUSTRIAL POWER, WATER, STEAM, AND LOCATIONS illustrates and describes the power, water, and steam facilities made available by the Grand River Dam Authority; low-cost industrial sites of from 10 to 50 acres; and other advantages for plant locations in the GRDA area of northeastern Oklahoma. Access to transportation, raw materials, fuels, and labor are also covered. *Grand River Dam Authority.*

8 McMURRY RELIEF VALVE is a four-page folder describing a relief valve that, when installed in pipe lines, will relieve excessive pressure due to thermal expansion. Sectional drawings thoroughly illustrate installation and operation. *Paul McMurry.*

9 KEYSTONE CATALOG. This 20-page catalog lists pistons, piston rods, lube-seal unions, ceramic bubble caps, back-pressure valve, canvas coverings for equipment, Hamer Oil Tool Co. valves, valve-rebuilding service, and Gil-Lair ball-bearing

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, June 5, 1950

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swivel-pipe couplings. *Keystone Tool Corp.*

10 KOR-KING CONVENTIONAL CORE DRILLS. In addition to descriptions and illustrations, a cutaway illustration of a standard inside vent core drill explains the advantages and operating of a complete coring service. Both hard and soft formation cutter heads, core catchers, and Kor-King assemblies are featured. A price schedule is also included. *Reed Roller Bit Co.*

11 REMOTE-READING ELECTRICALLY OPERATED FLOW METERS fully illustrates and explains flow-measurement problems and their solutions. Meter bodies, differential devices, and reading instruments are fully described and a special section is included on wide range and reverse flow. *Republic Flow Meters Co.*

12 TEN BASIC OILS is a set of data sheets bound in a file folder, covering a selection of modern motor and diesel-engine oils. Each data sheet covers applications, characteristics and physical properties. *Commerce Oil Corp.*

13 EVERYTHING IN SAFETY is a 46-page catalog of personal protective equipment and industrial safety devices. It covers respiratory devices, eye protection, hats, gloves, carboy pumps, drum pumps, and other industrial safety equipment. *General Scientific Equipment Co.*

14 TERGITOL SURFACE-ACTIVE AGENTS. Properties, uses, and specifications of Tergitol wetting agents and penetrants are given. Data on average wetting times for different products are presented. *Carbide & Carbon Chemicals Division of Union Carbide & Carbon Corp.*

15 FOR EVERY DRILLING PROGRAM TO 3,000 FT. WITH EXPLORATION PIPE, a new 12-page, two-color, illustrated bulletin features an easy-to-use Select-O-Chart which makes possible the selection of the right drill to meet individual drilling requirements. This chart presents all six drills of the No. 200 series under headings of model number, depth, size of drill pipe, maximum hole size, applications, drive combinations, weight, and drill-head arrangements. *Joy Manufacturing Co.*

16 STEAM, AIR, GASOLINE TRAPS. This 32-page illustrated catalog describes: Five types of thermostatic steam traps for pressures to 225 lb.; two types of expansion steam traps for pressures to 250 lb.; three types of weight-operated traps for steam, air, or gasoline, pressures to 1,500 lb.; piston-operated steam traps for pressures to 650 lb.; and three types of steam, air, and gas separators. Complete with capacity tables, installation diagrams, as well as a section containing data, charts, and formulas for determining the proper size trap for specific applications. *W. H. Nicholson & Co.*

17 COST OF REFINERY CONSTRUCTION is a new 16-page illustrated booklet about cost control and price responsibility in the engineering and construction of refineries and natural-gasoline plants. *Refinery Maintenance Co., Inc.*

18 CHECK LIST FOR V-BELT DRIVES. Suggestions to help users to determine the exact condition of their V-belt drives are contained in a four-page inventory survey check list. The standards carried in the check list make it possible for users to decide which of their belt sets are satisfactory as is, which will shortly require replacement, and which need immediate replacement. *Allis-Chalmers Manufacturing Co.*

19 PRESSURE REGULATING VALVES AND MASTER CONTROLS. A new 12-page bulletin covering the company's complete line of low-pressure regulating valves for controlling gases and liquids in level, temperature, or pressure requirements. Printed in two colors and illustrated with photographs, diagrams, and line drawings, it gives full specifications and selection data on regulating valves, valve accessories, and pressure master controls. *Swartwout Co.*

20 PUMP PULSATION PROBLEMS. The pump pulsating problem is treated in detail by this new publication which provides illustrations of typical pumps, flow diagrams of output, and formulas for determining the sizes of pneumatic accumulators necessary to obtain optimum dampening of pressure surges. *Greer Hydraulics, Inc.*

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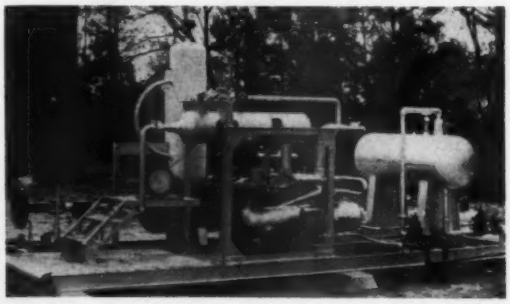
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by Dan B. Miller

21 HYRECO PROCESSING UNIT is a complete and unitized high-pressure gas-well hookup. It completely eliminates the use of a heater, replaces conventional well-head arrangements, and recovers a maximum stock-tank liquid per foot of gas flowed. Further, it delivers gas to the pipe line essentially free of liquid hydrocarbon and water. The unit includes a water knockout, the Hydracepter, a special high-recovery separator; a second-stage flash chamber (when required), and prefabricated piping. The unit is designed to operate under conditions which provide for the condensation and recovery of 10 to 25 per cent and more additional liquid hydrocarbons per cubic foot of gas flowed. In one instance a conventional installation on a Louisiana location produced 42.5 bbl. of stock-tank liquid per million feet. After a Hyreco unit was installed, production jumped to 48.9 bbl. per million, an increase of over 15 per cent. *Parkersburg Rig & Reel Co.*

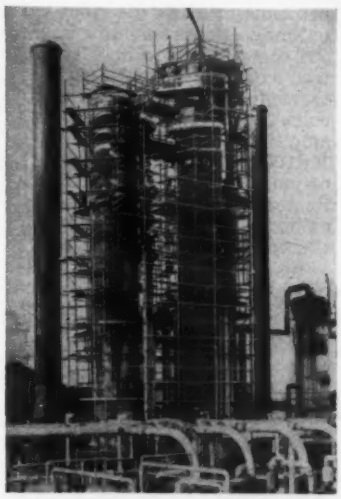


IT'S NEW CHECK IT

22 ACRAWATT "WRAP-AROUND" DRUM HEATERS are designed for heating standard 55-gal. drums containing such materials as resins, plastics, oils, greases, and chemicals. Units are slipped over drum and held in place by tightening clamping screws and are easily removed for transfer to another drum. They are rated at 3,000 watts at 230 volts. Three stud terminals, housed in outlet box, provide connections for three-heat operation (750, 1,500, or 3,000 watts). A three-way rotary snap switch can be installed on the outlet box cover by the user, should this convenience be desired. Sheath is of aluminized steel and resistor is of nickel-chrome, insulated by high-grade mica. *Acra Industrial Electric Co.*

IT'S NEW CHECK IT

23 TUBELOX, a tubular-steel scaffolding is ideal for plant construction and maintenance work. It can be erected and dismantled in a minimum of time and is strong and fireproof. Tubelox is available in light-weight, high-carbon steel tubing or aluminum. The four basic parts are: tubes, bases, and two types of couplers. Locking devices between members makes continuous tubes. Connections are quickly made with a ratchet wrench. Can be mounted on free-rolling casters, with brakes which hold firmly. Tubes are generally of 2-in. diameter, but the 2½-in. size is available for heavy-duty installations. *Patent Scaffolding Co., Inc.*



IT'S NEW CHECK IT

24 SUPER-SAFETY SNATCH BLOCK. A new lock-pin design does away with any tool requirements. There are no threaded bolts or nuts to misplace or foul. The bronze hub caps on the sheaves prevent any sparking dangers around gas or oil. Within a matter of seconds, the wire line can be inserted in the sheave by turning the lock pin to the right, then pushing the pin through the slot, releasing the side plate. By reversing this procedure the block is ready for use. This procedure can be followed when block is hanging in derrick or atop

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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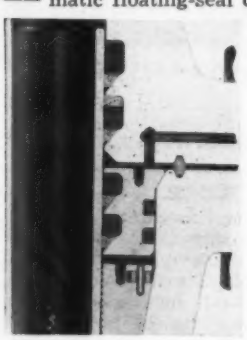
the gin pole, without the use of tools. It is completely drop-forged, heat-treated, and precision-machined of top-quality steel. Available in 4½, 5¾, 6, 8, and 10-in. size. *LeBus Rotary Tool Works, Inc.*

IT'S NEW CHECK IT

25 MAGNETIC CORE ANALYZER. This machine is an electronic device which measures residual magnetism in cores. It is possible to tell how the structure was oriented in the ground by measuring the magnetic north of the small amount of magnetic material which is in the structures. Furnished in a battery-operated portable model weighing approximately 50 lb. Instrument operates on the principle of using the residual magnetism remaining in the cores to set up an electric current which flows through special pick-up coils. This weak current is amplified approximately 100,000,000 times. The indication is shown on the vertical deflection plates of the cathode-ray tube. Due to the use of a special fixture as illustrated, a minimum amount of preparation of the cores is required. Core orientation service is available throughout the country through distributors. *H. M. R. Electronics, Inc.*

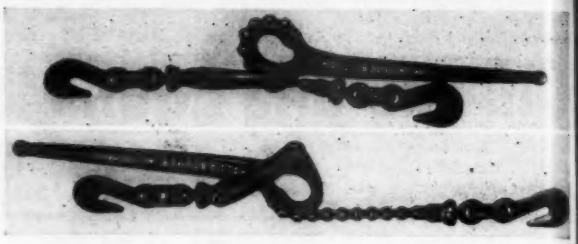
IT'S NEW CHECK IT

26 C-18-H CASING HEAD. A new 20,000-lb.-test automatic floating-seal casing head features extra-heavy seal rings. The new casing head is available in either a combination welded and oversized O-ring seal or in an all oversized O-ring seal type. The slips and seal are separate units. Thus, test loads are applied to the automatic sealing element and not to the slips. This removes any possibility of collapsing or crushing the pipe with test loads. Well pressure is utilized to equalize the seal all around the pipe. The extra-heavy seal rings are backed up by extrusion rings which conform to the plus or minus A.P.I. tolerances of the casing. The extrusion rings prevent the seal rings from flowing out under maximum pressures. *Oil Center Tool Co.*



IT'S NEW CHECK IT

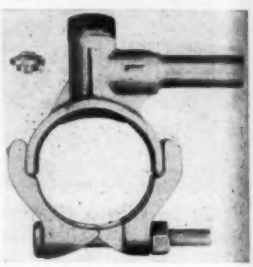
27 LOAD BINDER OR BOOMER. The Roll boomer is radically different in design. A cable chain winding over an oval-shaped drum permits one-third more take-up and additional pulling power. This extra takeup makes it unnecessary to take another bite in many cases and it is an important feature in binding loose material.



As the chain is taken up, the pulling power increases until the handle is in closed position. Added flexibility allows the boomer to conform snugly to the load, eliminating all side strain on the swivels. Instead of a quick snap opening, the Roll boomer releases the load gradually, a safety feature for the operator. *Roll Boomer Manufacturing Co.*

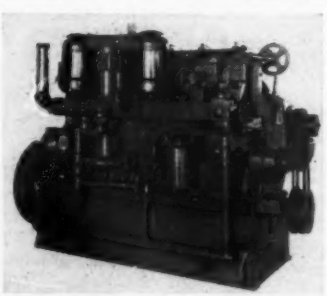
IT'S NEW CHECK IT

28 SKINNER-SEAL COUPLING SADDLE combines service saddle and street tee in one unit thus eliminating threads, the principal source of leaks and of branch-line failures. Savings of installation time are considerable and by making a single unit of these two fittings, stock binning is reduced. Fitting is made of malleable iron, ruggedly proportioned, and fitted with a single massive bolt. Machined to receive check valve, outlet has plain end for compression coupling. It is made in three pipe sizes, both steel and cast iron, 2, 3, and 4-in. by ¾, 1, or 1¼-in. *M. B. Skinner Co.*



IT'S NEW CHECK IT

29 MODEL LI-600 FULL DIESEL ENGINES, equipped with gas-butane operating equipment to enable use of most economical and convenient fuel supply, is capable of delivering 280 hp. maximum when burning 1,000 B.t.u. butane or 78-octane gas. When operating on diesel fuel the ratio is 16 to 1. On natural gas-butane it is lowered to 6.8 to 1. The engine has a 7-in. bore and 10-in. stroke. Crankshaft is 5½ in. in diameter and is mounted in copper-lead bearings. Large hand-hole plates are removable to permit accessibility to the connecting rods and main bearings. Weight of the engine is 10,400 lb. with radiator but less power takeoff. The engine can be converted to diesel operation by removing the gas-butane equipment and reinstallation of diesel equipment. *Cummins Sales & Service, Inc.*

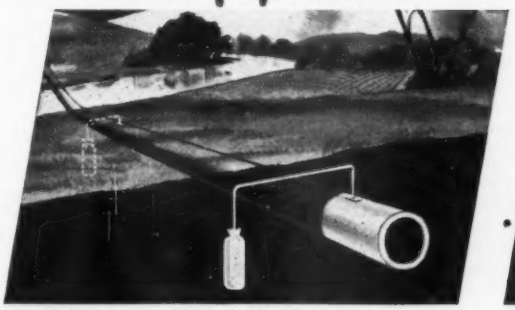


IT'S NEW CHECK IT

30 SPEED BRIDGE THERMOMETER is intended for application where conventional thermometers will not do. There is only one dial to adjust. Therefore it is possible to follow changing temperatures with a moderate reading error, particularly when high-speed units are used. The speed bridge dial has 1,000 divisions combining range and accuracy. Sensitivities of .01° are pos-

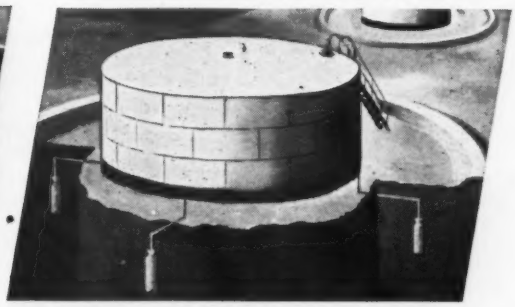
Dowell Magnesium Anodes Cut Corrosion Costs

on pipelines



Thousands of miles of buried pipelines are being protected against corrosion at low cost by Dowell magnesium anodes. Such galvanic protection is proving equally effective on coated, wrapped and bare lines.

on tank bottoms

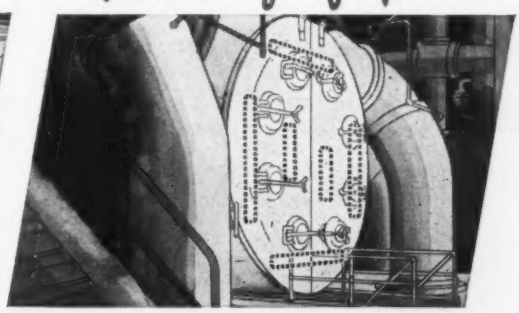


Many firms use Dowell magnesium anodes to prevent the corrosion of the bottoms of large storage tanks. This type of protection is also proving effective for oil lease tanks, gun barrels and completely buried tanks.

on sea water installations

Dowell magnesium anodes are proving satisfactory in controlling corrosion on steel piers, off-shore oil well drilling platforms, ship hulls and other underwater structures.

on operating equipment



The use of magnesium anodes to control corrosion in condensers, heat exchange equipment and many types of processing equipment is gaining wide acceptance.

Galvanic protection with high purity Dowell magnesium anodes has given industry a new way to cut corrosion costs. It has proved effective on a wide variety of installations. A system of Dowell magnesium anodes is easily and economically installed. It requires no external power and only minimum maintenance. Write to Dept. 12, Tulsa for a copy of the free 16-page booklet on galvanic protection with Dowell magnesium anodes.

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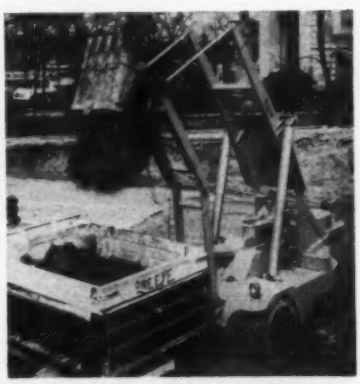
sible. This sensitivity can be maintained also at high temperatures. Any range from the temperature of liquid gases to 1,400° C. is available. The bulb can be hundreds of feet away from the bridge without appreciable error. It is housed in a steel case 7¾ by 12 by 7 in. with a carrying strap. *Paul G. Weiller.*

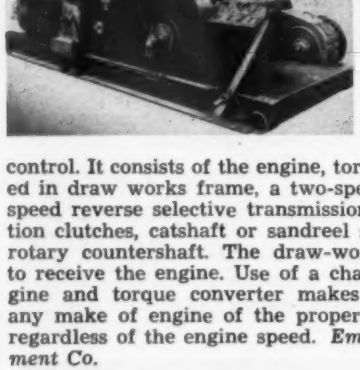
IT'S NEW CHECK IT

31 TYPE HL, MODEL 100 DEMPSTER-DIGGSTER. At extreme height, lowest point of the digging bucket is 13 ft. and 6 in. from the ground. This Diggster has a crowd reach of 10 ft. 6 in. and will dig through an 18-ft. bank. Operates with hydraulic crowd and hoist action, and is also available with crawler-type traction. *Dempster Brothers, Inc.*



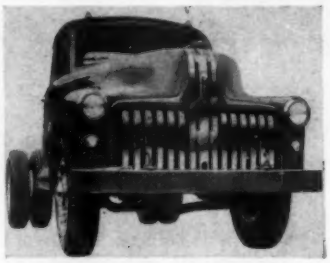
IT'S NEW CHECK IT

32 TORQUE CONVERTER RIG FOR 5,000-FT. DRILLING is a new low-cost 250-hp. drilling rig designed to meet the specialized requirements of shallow to medium depth drilling or deep workover operations. Identified as the GA-250-T, this new rig is a single-engine, torque-converter-equipped, single or double-drum draw works with console control. It consists of the engine, torque converter mounted in draw works frame, a two-speed forward and one-speed reverse selective transmission equipped with friction clutches, catshaft or sandreel shaft, drumshaft, and rotary countershaft. The draw-works skid is extended to receive the engine. Use of a chain drive between engine and torque converter makes possible the use of any make of engine of the proper horsepower capacity regardless of the engine speed. *Emsco Derrick & Equipment Co.*



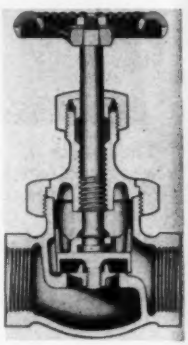
IT'S NEW CHECK IT

33 STYLE LINER is a new series of light and medium-duty commercial vehicles. The cab offers the best in comfort, visibility, and safety. It is 66½ in. wide at shoulder height and 77 in. wide at the bottom, and is of all-steel welded construction with a one-piece top, strongly reinforced throughout for extra durability. Swinglift fenders offer 100 per cent greater accessibility to the engine, accessories, steering, and front brakes. Front fenders are designed to raise on a concealed hinge by releasing a clasp. Mechanical improvements include a wider-track front axle and shorter wheelbases. Front and rear springs have been lengthened. Heavy-duty, full-floating-type hypoid rear axles have been provided. A choice of several axles of varying capacities and ratios in single-speed, two-speed double-reduction final drive are available. *Federal Motor Truck Co.*



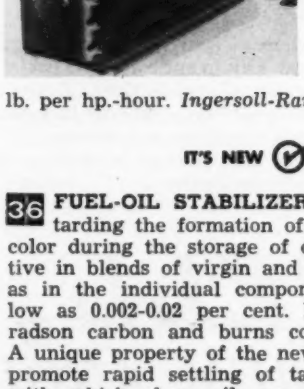
IT'S NEW CHECK IT

34 NEW L.P. GAS VALVES. A new line of globe, angle, and check valves for liquefied-petroleum-gas service has been tested and approved by Underwriters Laboratories, Inc., for use on L.P. gas up to a maximum of 250 psi. All three types have screwed ends and are available in sizes ¼ to 2 in., inclusive. To assure tight seating, the valves have a Crane No. 6 composition disk cemented into the disk holder. Tightness at the stuffing box is provided by one-piece molded asbestos packing in a stuffing box of liberal dimensions. Beside L.P.-gas service, the new line of valves is recommended for hot or cold water, compressed air, gasoline, light oils, and other services requiring sturdy, tight valves within their pressure and temperature ranges. *Crane Co.*



IT'S NEW CHECK IT

35 TS DIESEL. A completely new type of diesel engine, in the 195 to 375-hp. range, can easily be made portable, but is not automotive type; it is small in size, but with big engine design; light in weight, but with moderate speed; powerful, but with low exhaust temperature; perfectly balanced with no balancing devices. It is a four-cycle, 7-in. bore, 8½-in. stroke, single-acting engine with a weight of about 30 lb. per horsepower and a fuel consumption of 0.40 lb. per hp.-hour. *Ingersoll-Rand Co.*



IT'S NEW CHECK IT

36 FUEL-OIL STABILIZER. A new inhibitor for retarding the formation of sediment and maintaining color during the storage of distillate fuel oils is effective in blends of virgin and cracked distillates as well as in the individual components in concentrations as low as 0.002-0.02 per cent. It does not increase Conradson carbon and burns completely, leaving no ash. A unique property of the new inhibitor is its ability to promote rapid settling of tank bottoms and sediment with which clean oils are often contaminated when transferred to customers' tanks. Accelerated test procedures for evaluating the efficiency of the inhibitor in distillate oils are available. *Universal Oil Products Co.*

NATURAL GAS

Big Contract

134 billion feet of gas yearly involved in deal

BOSTON. — Signing of a contract under which Texas Eastern Transmission Corp. will buy annually approximately 134 billion cubic feet of natural gas from United Gas Pipe Line Co. has been announced here.

Part of the deliveries are to be made to Algonquin Gas Transmission Co., which proposes to serve the New England market with supplies from Texas Eastern. Hearings on proposals to bring gas into the New England area are now continuing before the Federal Power Commission *(The Oil and Gas Journal, May 25, page 172)*.

Dana M. Swan, Algonquin president, announced the gas-supply contract last week. It was described as probably the world's largest single natural-gas supply contract. He said it forms the "final link in the chain of events" necessary for Algonquin to bring gas to New England.

"Our enterprise to bring natural gas to New England now connects Algonquin Gas Transmission Co. with a proven and dependable transmission system, the nation's largest underground storage project *(The Oil and Gas Journal, May 25, page 183)*, and the United Gas system's extensive and proven gas reserves and resources," he said.

Describing the gas reserves behind his project, Swan said United controls more than 15 trillion cubic feet of reserves. This, he added, is based on estimates of Ralph E. Davies, Houston consultant. Swan said Davies had reported United could meet requirements of up to 700 billion cubic feet a year for more than 25 years, almost 200 billion cubic feet more than its 1949 sales.

FPC Reorganization

WASHINGTON.—A reorganization plan for the Federal Power Commission, which fixes responsibility for day-to-day administration in the chairman and gives the President the power to appoint the chairman, became effective May 23. FPC formerly elected its chairman. The plan was one of 16 government-reorganization plans approved out of a total of 21 which were sent to Congress by the President in March.

Mon C. Wallgren, who was appointed to FPC this year after the Senate turned down his nomination as chairman of the National Security Resources Board, was named chairman of FPC, taking over from Nelson Lee Smith.

Commissioner Thomas C. Buchanan, of Pennsylvania, was elected vice chairman by FPC to serve during the remainder of the calendar year 1950, succeeding Wallgren. He has been a member of FPC since July 1948.

Buchanan is a member of the Pennsylvania and American Bar associations, and was a member of the Pennsylvania Public Utility Commission from 1937 to 1945, and of the predecessor Public Service Commission in 1936-37.

A.G.A. Convention

NEW YORK.—American Gas Association announced last week that plans are now being prepared for its 1950 convention, which will be held in Atlantic City, N. J., October 2-6. George E. Whitwell, vice president, Philadelphia Electric Co., is chairman of the general convention committee, which is supervising the convention plans.

There will be three general sessions, all to be held in the ballroom of the Atlantic City Auditorium. Manufactured gas and natural-gas departments will hold a joint meeting at opening of the meeting October 2.

Algonquin Gas Hearing

BOSTON.—Hearing on Algonquin Gas Transmission Co.'s application to construct a natural-gas pipe-line system to serve the New England area will open here before the Federal Power Commission June 12.

A hearing has already been held before FPC on a similar application by Northeastern Transmission Co. *(The Oil and Gas Journal, May 25, 1950, page 172.)*

Algonquin's proposed project would cost $33,217,090, and would have an initial delivery capacity of approximately 260,000,000 cu. ft. daily. The system would comprise a 254-mile main line and 364 miles of laterals in New England.

Algonquin would acquire its gas from Texas Eastern Transmission Corp. *(See page 93 of this issue.)*

Michigan-Wisconsin Plan

WASHINGTON.—Intermediate decision procedure has been ordered omitted by the Federal Power Commission in the proceeding involving proposed expansion of Michigan-Wisconsin Pipe Line Co.'s Texas-to-Michigan natural-gas pipe line. Oral argument has been set by the commission to begin here June 15.

Michigan Consolidated Gas Co. is a joint applicant in the proceeding. The application proposes installation of additional compressor capacity on the Texas-to-Michigan and Wisconsin line which would increase its annual sales capacity from 56,575,000,000 cu. ft. to a new total of 110,595,000,000 cu. ft. In addition Michigan Consolidated would install facilities to provide additional storage capacity required in connection with Michigan-Wisconsin's expansion plans.

Associated Bid Advanced

WASHINGTON.—Associated Natural Gas Pipe Line Co.'s motion for waiver of intermediate decision procedure in the proceedings involving that firm's application to construct pipe-line facilities in southeastern Missouri has been granted by the Federal Power Commission, which means the case now goes directly to the commission.

Associated proposes to build the project at a cost of $900,000. The line would carry natural gas to the Sikeston and New Madrid, Mo., areas, and would include 14½ miles of 8½-in. and 21 miles of 6½-in. line. Gas-distribution systems in Sikeston and New Madrid would be included.

Acme Hearing Under Way

WASHINGTON.—A hearing opened before the Federal Power Commission here June 5 on application of Acme Natural Gas Co., Butler, Pa., for authorization to construct 19 miles of 10¾-in. pipe to serve three industrial consumers in the Butler area.

The company is also seeking an FPC order directing Manufacturers Light & Heat Co. to connect its pipeline system with the proposed line to be built by Acme, and to sell and deliver natural gas to the latter company. The proposed Acme facilities would have daily delivery capacity of 20,000,000 cu. ft.

T.G.T. Offers New Service

OWENSBORO, Ky.—Texas Gas Transmission Corp. has offered a new service to landowners along the rights-of-way of its natural-gas pipeline system—free information to aid in soil conservation.

A new booklet, "Conserving Your Soil," has been distributed to thousands of landowners which informs them of what steps the firm is taking to protect soil above its right-of-way property, and gives methods owners may follow to conserve their land to increase its yield.

"If we can help you to conserve soil and increase yields on the section of your farm, through which our pipe line runs, we make our own job of inspection and maintenance a bit easier," the booklet says.

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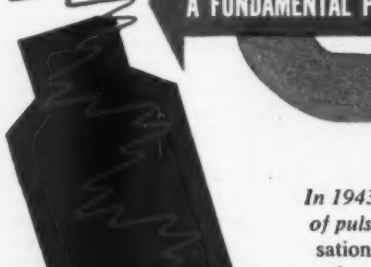

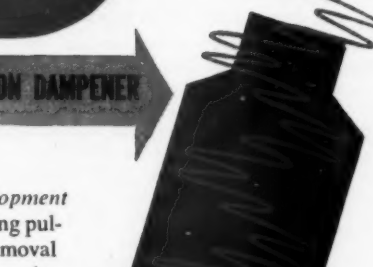

In 1943, The Fluor Corporation pioneered the development of pulsation dampeners. The first U. S. Patent covering pulsation dampeners designed specifically for the removal of gas stream pulsation and subsequent vibration in compressor piping was issued to Fluor in 1946.

Continued research in gas pulsation and its associated problems has established that pulsation, and its intricate secondary vibration, can be attributed to both fundamental and high frequency pulsations *—or to high frequency components alone.*

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REFINING

Finished Refinery

Socony-Vacuum completes East St. Louis expansion

LAST week marked the completion of an extensive modernization program at the East St. Louis refinery of Socony-Vacuum Oil Co., Inc.

New construction involved three major units, a 17,000-bbl. per day crude distillation unit, a combination thermal cracking and delayed coking unit, and a treating plant capable of handling 20,000 bbl. of gasoline daily.

These new facilities allowed retirement of some obsolete thermal cracking and coking units and will permit the scaling down of crude runs through some previously existing crude-distillation facilities. The net increase in crude capacity will amount to about 10,000 bbl. per day, raising the total refinery rating to 30,000 bbl. per day.

The new combination cracking-coking unit comprises two sections, each with separate fractionation towers. A 2,500-bbl. naphtha reformer and a 3,000-bbl. gas-oil cracker, each operating at 200 psi., will be served by one fractionator.

The other is tied into a combination visbreaker and coker which can be switched to those two alternate operations. The latter unit is capable of charging 9,000 bbl. per day of reduced crude and will operate at 50 psi. The coking unit can produce 240 tons per day of industrial coke for use as electrodes in aluminum extraction.

According to Charles P. Baker, refinery manager, the modernization program, besides boosting capacity of the plant 50 per cent, greatly improves the flexibility with which it can be operated to meet optimum product demand. Light-distillate yields are up. Where formerly 462,000 gal. were produced at an approximate yield of 55 per cent based on crude input, the modernized plant will be capable of an output of 756,000 gal., roughly 60 per cent of crude capacity. Residual fuel may be reduced to 1,000 to 1,500 bbl. daily or 3.3 per cent to 5 per cent of crude charged.

The refinery includes Houdry fixed-bed and Thermofor catalytic cracking units totaling 18,000 bbl. charge capacity. A hydrofluoric acid alkylation unit, shut down since the war, will be returned to operation late this year for production of high-octane blending components for aviation and motor fuels.

Distillate fuel oil production of the revamped refinery will be raised from 200,000 to 250,000 gal. daily, with a similar increase in kerosine capacity.

Petrochem Production Up

In spite of declines in several petroleum chemicals which enjoyed huge wartime demands, the total production of chemicals from petroleum and natural gas last year increased 28 per cent over 1948. According to preliminary figures released by the United States Tariff Commission, and considered 95 per cent complete, total petrochemical production reached 5 billion pounds in 1949 as compared with 3.9 billion in 1948.

Net increases were reported for both aromatics and aliphatics. Total aromatics and naphthenes rose from 892 million pounds to 1 billion pounds due mainly to stepped-up production of miscellaneous distillates, solvents, phenolates, and phenols. Petroleum-derived toluene and xylene showed declining production.

W.P.R.A. Regional Meeting

TULSA.—Western Petroleum Refiners Association will hold a 1-day regional meeting in Wichita June 23, John C. Day, executive secretary, announced last week. Four speakers will appear, two of whom will discuss technical aspects of refinery operations. The others will speak on industrial-relations topics.

K. M. Brown, Universal Oil Products Co., Chicago, will describe a CO_2 caustic neutralizer recently developed by his company. Dr. Harry C. Mahan, Wichita, will speak on "Recent Advances in Industrial Psychology"; W. Edward Lemon, Tulsa, manager of J. F. Pritchard & Co.'s petroleum division, will deliver a paper on "Can a Storage-Stable Distillate Fuel Be Manufactured?"; and John M. Napier, Wichita, will discuss job evaluation.

F. A. Deering, vice president of refining for Kanotex Refining Co., Arkansas City, Kans., will preside at the meeting, which will be held in the Broadview Hotel.

Oil-Tax Revenues Up

WASHINGTON.—Revenue from the three federal oil taxes for the current fiscal year which ends June 30 may run slightly above that for the 1949 year but probably by not much more than $25,000,000 to $30,000,000, it is indicated by the Treasury's experience for the first 10 months.

For that period, there was an increase of $26,477,000 in gasoline-tax collections and $29,000 in receipts from

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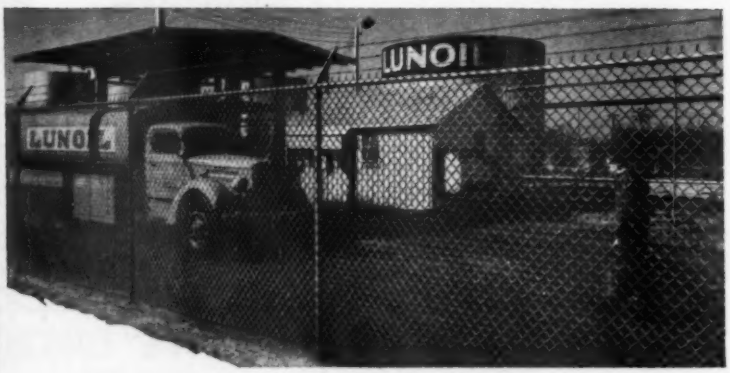

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pipe-line transportation, but a decline of $3,347,000 in the return from lubricating oils. For the current calendar year, however, the showing is somewhat better, with an increase of $26,000,000 in gasoline and $589,000 in transportation taxes collected up to April 30 as compared with the first 4 months of last year, and a loss of slightly less than $2,000,000 in lubricating oil taxes.

The monthly report of the Internal Revenue Bureau shows April receipts of $28,879,126 from gasoline against $28,106,619 in the same month last year; $3,417,288 from lubricating oils against $4,352,129, and $1,897,800 from pipe-line transportation against $1,259,471.

Fiscal-year collections topped the $500,000,000 mark in April, when gasoline-tax collections reached $434,965,398 against $408,488,804 last year; lubricating-oil receipts were $60,365,983 against $67,712,585, and pipe-line-transportation revenue was $15,926,967 against $15,898,175, the bureau reported.

Asphalt Production Rises

WASHINGTON.—Production of asphalt during the first 3 months of 1950 totaled 8,781,000 bbl., a gain of 317,000 bbl., or 3.7 per cent over the same period in 1949, the U. S. Bureau of Mines reported last week.

Production in March was up 418,000 bbl., or 14 per cent, to 3,315,000 bbl. compared to the same month last year.

Total asphalt demand in the first quarter totaled 7,085,000 bbl., up 720,000 bbl., or 11.3 per cent from the same period last year. Domestic demand was up 896,000 bbl., or 14.9 per cent, to 6,865,000 bbl.

Asphalt Plant Sold

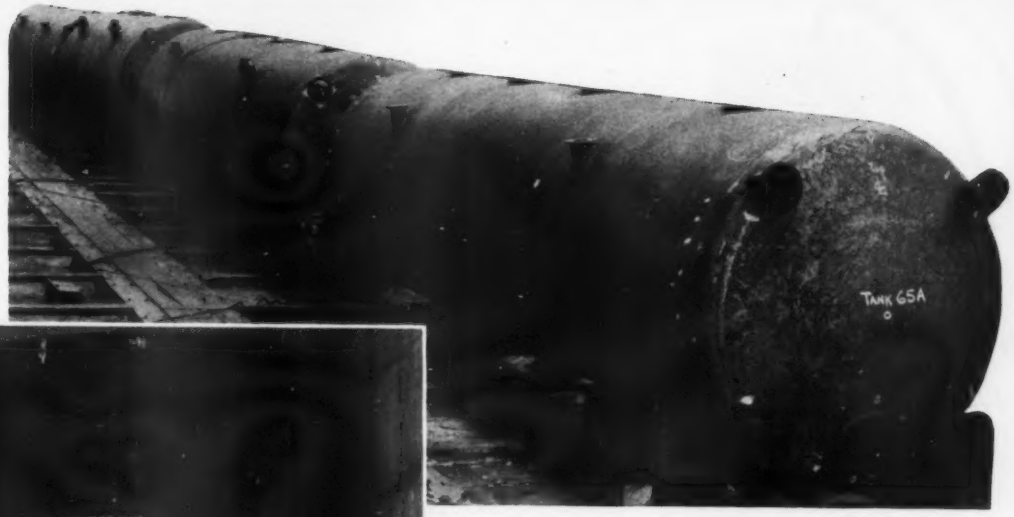
WEST BRANCH, Mich.—Producers Refining, Inc., which operates a 3,500-bbl. refinery here, has purchased the Asphalt Products Co. of West Branch, according to James P. Dunnigan, Producers Refining president.

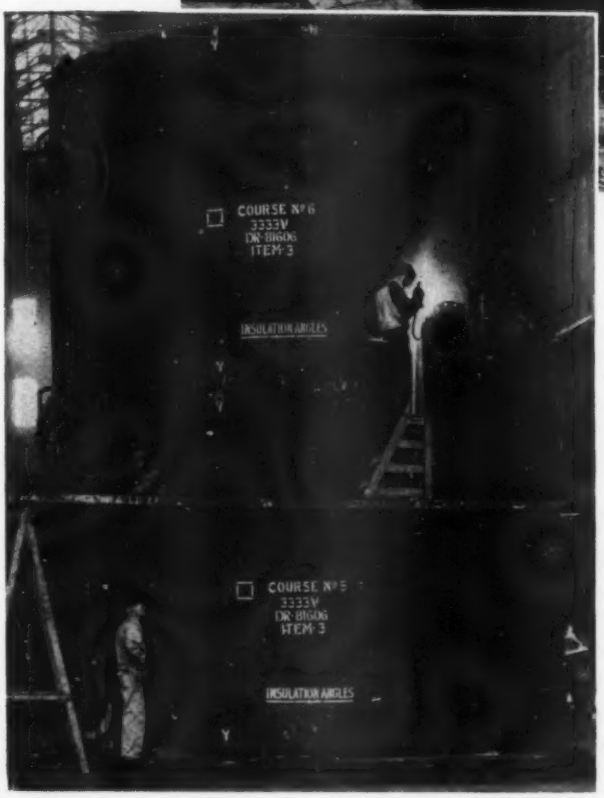
Dunnigan said that all purchases and sales of Asphalt Products would be made by Producers Refining. The two firms have operated closely over the past 10 years and the management of Producers Refining's asphalt division will remain the same. Purchase price of the facilities was not disclosed.

Expanding Catalyst Plant

CHICAGO.—New equipment is being added to the plant of National Aluminate Corp.'s catalyst division here which will nearly double the plant's production, H. A. Kern, president, said last week.

The expansion will provide for production of microspheroidal catalyst by spray-drying operations.





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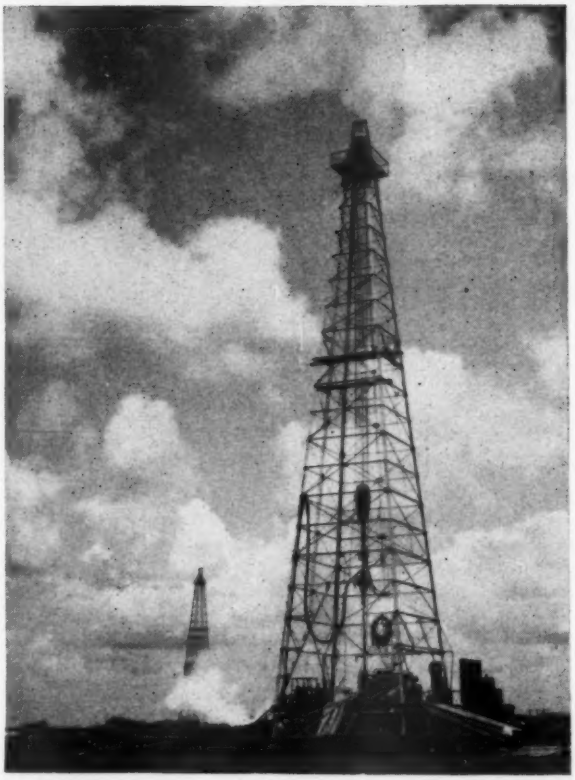

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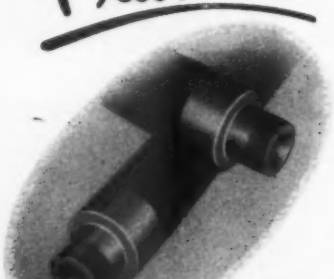

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Among the Drilling Contractors

Upward Trend Continues In Drilling Rig Activity

Drilling activity in the United States and western Canada continued its upward trend during the week ended May 29 (latest survey) with another substantial increase reported in the number of operating rotary rigs.

Active rigs for that week totaled 2,225, a gain of 61 over the number listed the previous week's survey, and a new high mark for this year. The number represented an increase of 114 rigs within 2 weeks and 127 rigs since May 1.

Seventy more rigs were running than were reported during the corresponding week of 1949. The number lacked only 59 of equaling the peak of that year. Activity increases were indicated in all areas except Kansas and the Pacific Coast.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 5-29-50	Change week ended 5-22-50	Change week ended 5-30-49
Gulf Coast	516	+18	— 69
W. Tex.-N. M.	751	+27	+208
Ark.-N. La.-E. Tex.	133	+ 2	— 35
Oklahoma	275	+18	+ 34
Kansas	126	—28	+ 12
Illinois-Eastern	148	+13	+ 22
Rocky Mountains	87	+ 4	— 24
Pacific Coast	120	— 1	— 78
Total United States	2,156	+53	+ 70
Western Canada	69	+ 8	— 10
Total	2,225	+61	+ 60

*Courtesy Hughes Tool Co. Trends in drilling activity for the United States and for the Rocky Mountain and western Canadian areas are shown by graphs on pages 128 and 129.

Clyde Gibson, Wichita Falls, Tex., has the contract on Russell Maguire 1 Grimes, Ellenburger wildcat test in the SW SE 74-16-H&TC Survey, 7 miles south of Chillicothe, Hardeman County, North Texas.

Mose Wagner, Cut Bank, Mont., is drilling a Devonian test for L. B. O'Neil on the latter's Marias River dome block in southwestern Liberty and southeastern Toole counties, Montana. Location for the test, 1 Brown, is in 29-30n-5e. Rotary tools are being used.

Parker Drilling Co., Tulsa, is the contractor on a test which Sun Oil Co. is starting at a wildcat location 7 miles southwest of Maryneal, Nolan County, North Texas. The location, in 43-1A-H&TC Survey, is 3½ miles north of the Arledge field, Cooke County.

Harvey Drilling Co., Wichita Falls, Tex., is drilling for James H. Snowden and associates at 1 Norman, a projected 5,000-ft. test in the Dames Bush Survey, 1 mile south of Woodbine, Cooke County, North Texas. The location is about 2 miles southwest of production in the Woodbine area.

Viersen-Cochran Drilling Co., Oklahoma City, is drilling for Bay Petroleum Corp. at 1 Gibbs, a newly started test at the south tip of the Sholem Alechem pool, Carter County, Oklahoma. Location is in 22-2s-3w.

L. H. Choate, Cisco, Tex., is drilling a Mississippian test for Ted Weiner and associates of Fort Worth at 1 Campbell Estate, G. Robertson Survey, 2 miles south of Anarene, Archer County, North Texas. Contract is for 5,250 ft.

Mitchell & Gage Drilling Co., Oklahoma City, has the contract for a 6,000-ft. Bartlesville sand test which K. A. Rogers and associates are starting at 1 Wyman, 8-12n-1w, 2½ miles east of Spencer, Oklahoma County, Oklahoma. The location is about a mile east of the Munger pool.

Roeser & Pendleton, Inc., Fort Worth, is drilling for Lion Oil Co. at 1 Allred, NW SW 23-6n-6e, a south offset to the recently completed discovery well of the West Lincoln field, Lincoln County, Mississippi. Contract is for 10,800 ft.

Loffland Brothers Co., Tulsa, is starting two additional tests for the California Co. in the Romere Pass field, Calcasieu Parish, southwestern Louisiana. Both tests, located in 22-20s-19e, are projected to depth around 9,850 ft.

Allen & Morris, San Antonio, have contracted to drill an 8,700-ft. wildcat test for Deep Rock Oil Co. at 1 Edwin Nagle, Mumford House Survey, 1¾ mile northwest of the Arneckville field, DeWitt County, South Texas.

Deardorf Oil Corp., Oklahoma City, is the contractor on a 3,750-ft. Bartlesville sand test being started by Arthur B. Ramsey in the West Banner pool, Kay County, Oklahoma. The test is on the Koehler lease in 12-27n-1e.

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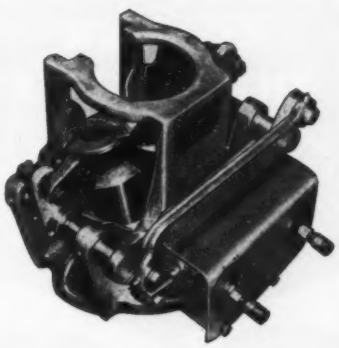

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Thompson-Carr, Inc., Houston

History.—Through A. W. Thompson, one of its owners, Thompson-Carr Inc., Houston, traces its lineage to the Mohawk Drilling Co., which Thompson and the late Fred Backon organized in 1924 to engage in the drilling contracting business. Four years later, in 1928, this original company was reorganized under the name of Mandeville & Thompson. The present organization and firm name came into existence in 1939 when Thomas P. Carr joined Thompson in the acquisition of the physical properties and interests of Mandeville & Thompson.

A. W. THOMPSON

Growth.—The original Thompson company started with two rotary rigs, each having a rated depth capacity of 4,500 ft. The present firm, in a steady expansion of its operations, owns and operates 11 power rigs and 3 drilling units. Rigs include 6 with rated capacities of from 10,000 to 12,000 ft. each; 3 designed to drill to depths of 6,000 to 8,000 ft., and 2 to 5,000 ft.

Personnel.—Thompson is president and general manager. He has been active in the oil industry since 1919. He now is national vice-chairman of the rotary drilling-equipment committee of the American Petroleum Institute; director of the American Association of Oilwell Drilling Contractors; and chairman of the latter association's educational and research committee.

Carr is vice president. He began his career in the oil business with the Sinclair companies in the early twenties. He was with those companies until he resigned in 1939 to become associated with Thompson. During the war, he served as a major in Army intelligence.

Fred Forster, another vice president, has been with the firm and its predecessors since the original company was organized in 1924. He started as driller, and subsequently served, in turn, as toolpusher, drilling superintendent, and vice president in charge of operations.

Operations.—Currently, all 11 rigs are operating in the Permian basin area of West Texas and New Mexico. All are under contract to majors.

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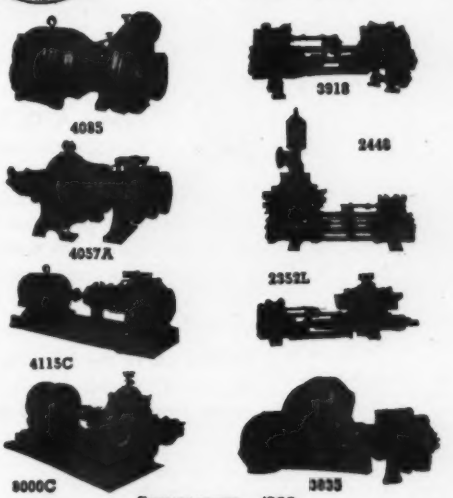

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A. O. Smith 1874 1950 76th ANNIVERSARY

PIPE LINES

Plan New Booster Station

CHICAGO.—Standard Oil Co. (Ind.) plans to construct an intermediate booster station on its 8-in. western products pipe line at Muddy Creek in Missouri, about 50 miles north of the Sugar Creek, Mo., refinery.

This all-electric pumping station, the third intermediate station to be constructed on the Sugar Creek-Des Moines-Sioux Falls pipe line during the past 18 months, will have two 400-hp. motors driving centrifugal pumps. It will be designed for semi-automatic operation and is necessary to insure adequate pumping capacity during peak demands, the company said.

Construction of the station building will be of steel framework with masonry walls, and most of the work will be contracted. If present schedule is followed, it will be in operation by November 1.

The two other booster stations on this line are at Burlington Junction, Mo., and Whiskey Creek, near Sioux Falls, Iowa.

Additional product-storage tanks are being constructed at pipe-line terminals located at Des Moines, Sioux Falls; Rochelle, Ill., and Minneapolis; and at river terminals at Peoria, Ill., and Bettendorf, Iowa. Tanks are also under construction at the Green Bay, Wis., lake terminal.

The expenditure for these facilities is undertaken by Standard Oil in order to insure that an adequate supply of gasolines and heating fuels will be available to consumers during seasons of peak demand, the firm reported.

33-Mile Line Completed

HOUSTON.—Associated Pipe Line Contractors, Inc., has completed a 33-mile, 20-in. natural-gas line for Texas Eastern Transmission Corp.

The line runs from Hankamer to Beaumont, Tex. C. E. Rogers served as spreadman during it construction.

Plans for Line Dropped

WASHINGTON. — Georgia Natural Gas Co., Albany, Ga., has withdrawn an application to the Federal Power Commission to build a 335-mile natural-gas pipe line to serve markets in southwestern Georgia and Tallahassee, Fla. The project would have cost an estimated $4,872,593.

The Georgia Natural project would have served part of the area proposed to be served by Atlantic Gulf Gas Co., which now has an application pending before FPC. Georgia Natural told the commission in its application filed March 27, that it was an alternative proposal in the event a certificate was not issued to Atlantic Gulf.

Humble Line Progressing

HOUSTON.—The 193-mile eastern section of Humble Pipe Line Co.'s West Texas-to-Baytown crude-oil pipe line has been completed by Anderson Brothers Corp., construction contractor. Morrison Construction Co. has construction contract on the 178-mile western section of the 18-in. line.

Anderson Brothers is now engaged in laying seven river crossings for Transcontinental Gas Pipe Line Corp. in Louisiana, Virginia, Maryland, Pennsylvania, and New Jersey, and 83 miles of 30-in. from Eunice, La., to the Sabine River.

Pump Stations Under Way

TULSA.—Refinery Engineering Co. reported here that construction is under way on five crude-oil pumping stations on the Interprovincial Pipe Line Co. route in Canada.

Expected to be completed in September are stations at Edmonton, Alta., and Ermine, Sask.; scheduled for completion in October are stations at Regina, Sask., and Cromer and Gretna, Man.

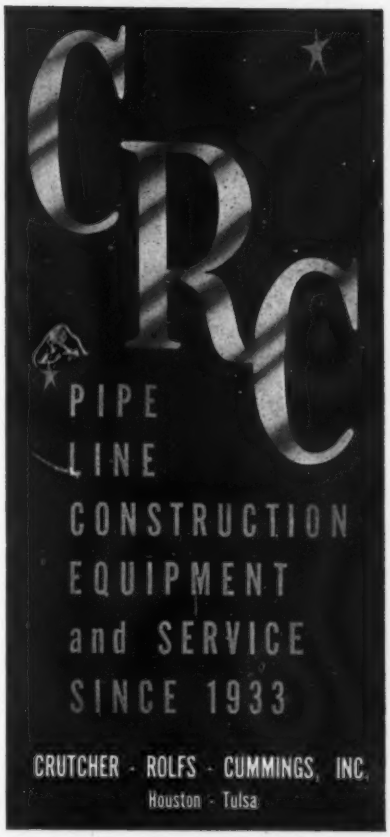
Products Flow in Lines Up

WASHINGTON.—The U. S. Bureau of Mines reported here last week that volume of refined petroleum products handled by pipe lines in the country was up considerably during the first quarter of this year, compared with the same period a year ago.

Products delivered from pipe lines totaled 98,895,000 bbl. during the 3-month period, which is an increase of 13.3 per cent, or 10,582,000 bbl. Products turned into pipe lines totaled 90,601,000 bbl., up 12.5 per cent, or 9,896,000 bbl.

Of the total products turned into lines, motor fuel comprised 72 per cent of the volume. Distillates accounted for 20 per cent, and kerosine, 8 per cent. During the first quarter of 1949 the ratios were: 75 per cent motor fuel; 18 per cent distillates, and 7 per cent kerosine.

A total of 63,692,000 bbl. of motor fuel was delivered from lines during the first quarter this year, a gain of 10.1 per cent, or 5,879,000 bbl. over the same period last year. Distillate deliveries totaled 19,585,000 bbl., up 23.7 per cent, or 3,781,000 bbl. over



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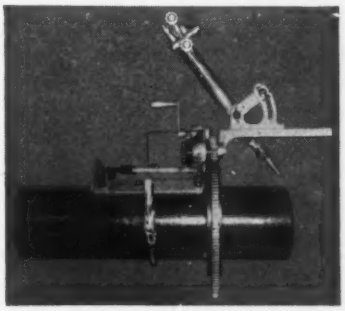

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SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
ECONOMY: Save approximately one-half labor and gas costs.
PORTABILITY: Can easily be carried from one pipe section to another.
Write for Literature and new, lower prices. Out Of Rounds attachment fits all machines.

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last year. Kerosine delivered totaled 6,618,000 bbl., a gain of 18.2 per cent, or 1,022,000 bbl.

Motor fuel turned into lines during the 3-month period totaled 24,142,000 bbl., a gain of 13.4 per cent, or 2,853,000 bbl. over the same period in 1949.

New York Natural Plans

PITTSBURGH.—New York State Natural Gas Corp. plans to construct 164 miles of 16-in. line from Ithaca to Albany, and 70 miles of 20-in. from North Oakford storage pool in Westmoreland County, Pennsylvania, to the Ohio state line. The company reported the following projects planned and under construction at present:

53 miles of 16-in. loop line in Greene, Washington, Allegheny, and Westmoreland counties, Pennsylvania.

3 miles of 16-in. line in Tioga County, Pennsylvania.

56 miles of 20-in. loop line, Tioga County, Pennsylvania, and Steuben, Chemung, Scuyler, and Tompkins counties, New York.

The firm reported that it had recently completed laying 1½ miles of 16-in. line in Potter County, Pennsylvania.

Peoples Natural Gas Co., affiliated with New York State Natural, is planning to lay 15 miles of 8 and 10-in. line connecting Tennessee Gas Transmission Co. with Peoples' system in Beaver County, Pennsylvania, and 3 miles of 12-in. line connecting its system to North Oakford storage pool in Westmoreland County, Pennsylvania.

Kansas Runs Show Gain

WICHITA.—Estimated pipe-line runs of Kansas crude oil averaged 282,793 bbl. daily during the week ended May 29, according to the State Conservation Division of the Corporation Commission. The runs were below the May allowable of 285,000 bbl. daily, but were up 483 bbl. daily over the preceding week.

June production has been raised to 295,000 bbl. daily, resulting in a substantial boost in prorated wells and a 10-bbl. per day hike for wells in 93 restricted but nonprorated fields. Per well limit in the restricted fields is 60 bbl. daily.

El Paso Decision Near

WASHINGTON.—The Federal Power Commission will decide soon whether or not El Paso Natural Gas Co., Houston, will be permitted to construct a natural-gas pipe line from the San Juan basin to the Arizona-California border.

The commission has ordered intermediate decision procedure omitted and has scheduled oral argument to be held here June 19. The proposed line would have a capacity of 150,-

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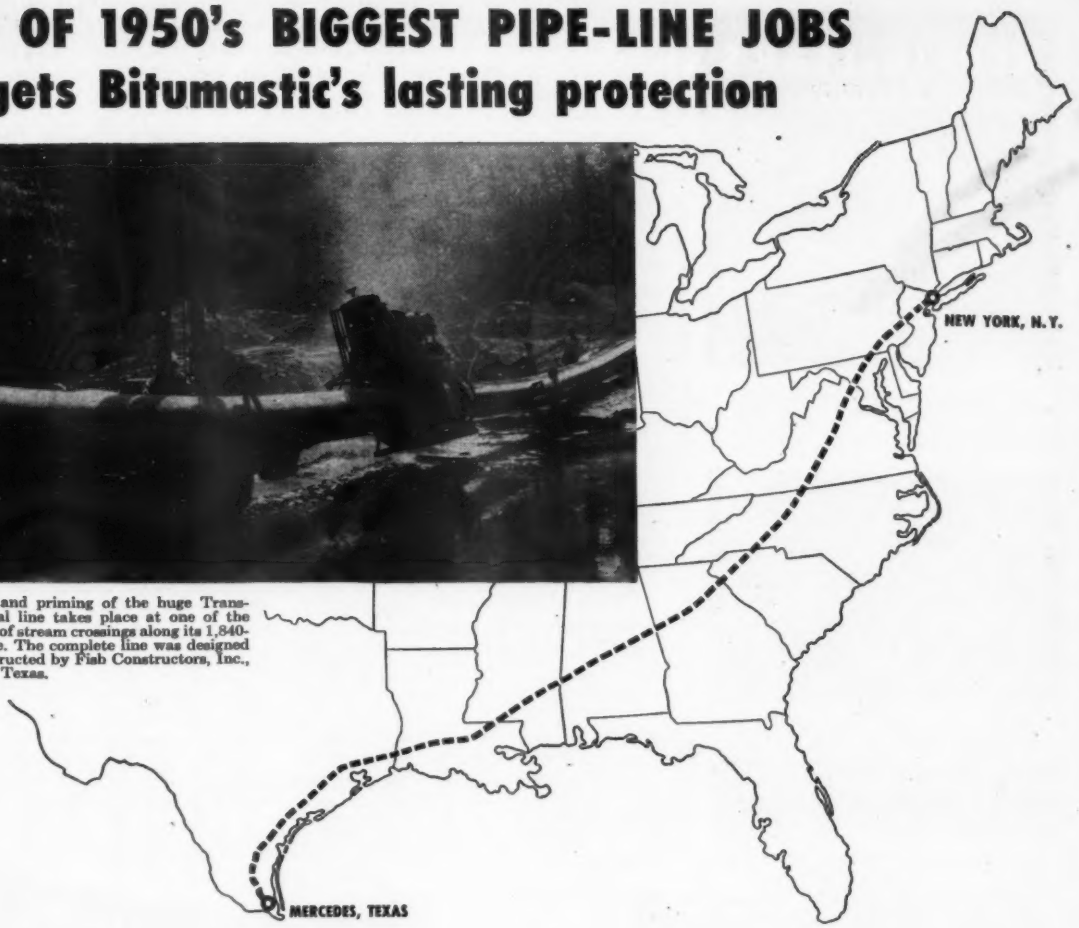
Cleaning and priming of the huge Transcontinental line takes place at one of the hundreds of stream crossings along its 1,840-mile route. The complete line was designed and constructed by Fiab Constructors, Inc., Houston, Texas.



● By late Fall, the 1,840-mile line being laid by the Transcontinental Gas Pipe Line Corporation will be supplying natural gas to the Philadelphia—New York—New Jersey area.

And, like many of the country's other big pipe-line projects, it will be protected against corrosion by Koppers Bitumastic® Enamel for many miles of its length. Portions of the 30-inch line which Bitumastic will protect include some of the most highly corrosive soils encountered—low, swampy land along the Gulf Coast.

Bitumastic Enamel has been used for over 25 years in coating thousands of miles of gas and oil lines. The knowledge gained by Koppers from the experience on these many successful applications can prove to be of value on your next pipe-line job.

Put "Koppers Bitumastic Enamel" into the specifications of your next job. You'll be getting a coating that has proved itself by years of satisfactory service under the most extreme corrosive conditions . . . in all types of soil . . . under variations of temperature.

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000,000 cu. ft. of gas daily, with gas going to Pacific Gas & Electric Co.

The line would extend from the San Juan basin of New Mexico and Colorado to a point near the Arizona-California border, with P. G. & E.'s proposed line extending on to the San Francisco area. Additional gas would be apportioned among towns in New Mexico and Arizona.

Application proposing construction of the line was originally filed by San Juan Pipe Line Co., El Paso affiliate, and has been pending before FPC since last July.

24-Mile Line Approved

WASHINGTON.—East Ohio Gas Co., Cleveland, has been authorized by the Federal Power Commission to construct 24 miles of pipe line in northeastern Ohio extending from a connection with Tennessee Gas Transmission Co.'s facilities near Petersburg to East Ohio's Austintown Station near Youngstown.

The line will enable East Ohio to receive additional supplies of gas from Tennessee Gas which is now extending its system from Kentucky to Buffalo. East Ohio said the line will make available a larger supply of gas to meet demands being made upon its system and will not be used to render any new or additional service.

The 20-in. line will cost approximately $982,565 and will be completed by fall.

Pipe Liners Finish Studies

TULSA.—Forty employes of Interstate Oil Pipe Line Co.'s Wilson, Okla., district recently completed the second group of off-duty studies on oil pipe-line transportation practices and procedures.

The course, consisting of 2-hour classes held twice weekly in the evenings, was one of a series of courses started early last year under auspices of the Oklahoma Department of Vocational Training.

Equitable Wants New Line

WASHINGTON. — Equitable Gas Co., Pittsburgh, has asked the Federal Power Commission to authorize construction of natural-gas facilities near Waynesburg, Pa., which would increase capacity of its pipe-line system by approximately 21,000,000 cu. ft. daily.

The proposed project would cost about $1,684,700, and would include a new compressor station, dehydration plant, and approximately 4½ miles of 16-in., 1 mile of 12-in., 7½ miles of 6-in. pipe, and 2 miles of 8-in. line.

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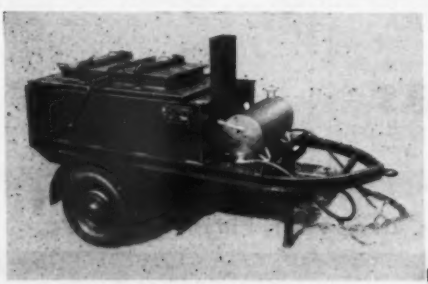

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Split bonnet, held together by two alloy steel bolts, facilitates renewing stem packer.
Gate stem reveals extent of wear on resilient flow-way insert when valve is in closed position.
Heat treated alloy steel gate shown in closed position embedded in the resilient flow-way insert. In open position, it is retracted completely out of the flow-way.
Lip-type stem packer requires no packing gland.
Replaceable alloy steel wear ring which protects the hub ends against cutting.
Renewable resilient flow-way insert which absorbs cutting action of abrasive-laden fluid and which may be replaced in the field, quickly and at low cost. Note how the resilient insert provides a pressure-tight seat for the gate and seals the two-piece valve body.
Hubs with any type of end connection desired are interchangeable and are attached to the body by interlocking shoulders and grooves. Loosen the body bolts and the hubs will swivel like a union when making up in a manifold.
Forged steel body in two pieces to facilitate changing the flow-way insert.

The Inside Story

There is no other valve like the Cameron Flex-Seal. It was designed for one service and one service only . . . drilling mud and similar abrasive fluids which quickly cut out the metal-to-metal seal in ordinary general purpose valves.

The inside story of the valve that has revolutionized mud line manifolding is presented at left. Operators who may not be familiar with its unique design are invited to study this sectional view or, better still, order a few "Flex-Seals" and check their performance under actual operating conditions.

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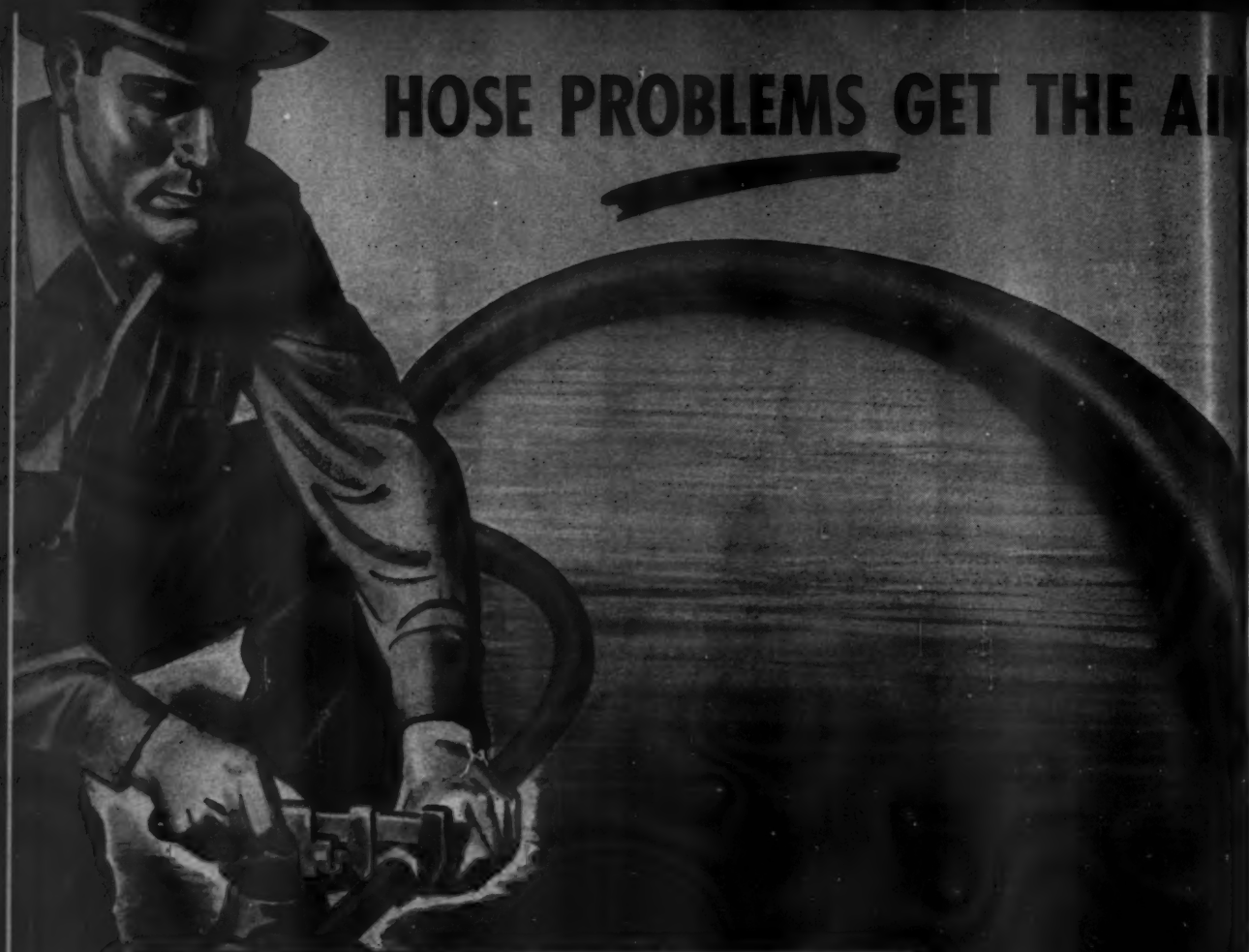

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Exploration and Drilling

Cuyama Valley Still Commands Interest

INTEREST of California's drilling fraternity continues to be centered largely around exploration and development activities in the Cuyama Valley in central California. Within the valley, renewed wildcatting in the eastern portion is claiming a share of the spotlight which in recent weeks has been focused around development activity in the northwestern portion.

The valley now has four discoveries to its credit: Russell Ranch, South Cuyama, and two in northwestern Cuyama which were opened within the past 2 months. In Russell Ranch, where 138 producers have been completed, only one rig is at work. South Cuyama, some 4 miles to the southeast, now contains about 120 producers and 7 rigs are busily adding to the total number.

Northwest of Russell Ranch about 3 miles, is the new North Cuyama area. There, early in April, Superior Oil Co. completed a 450-bbl. per day flowing well from a sand horizon at 5,635-6,105 ft. Three offsets to the discovery, which was Superior 18-2 Government in Section 2-11n-28w, are under way. All have been "no dope" holes.

In an attempt to extend production some ¾ mile to the southwest, Hancock Oil Co. found the deep pay cut out but did encounter a good section of Morales sand between 1,750 and 1,920 ft. The test, its 65-10 Hancock-Oceanic in Section 10, accordingly was plugged back and completed as a 100-bbl. pumper in the Morales.

Last week Southern California Petroleum Corp. completed a northwest offset for better than a 100-bbl. pumper, finding the top of the Morales at 2,115 ft. A north offset is under way and two additional locations have been staked by Southern California. In addition, two locations to the south of the discovery well Bishop Oil Co. has moved in equipment for its 67-10 Chorum.

In the extreme eastern and southern portions of the valley, all attempts to establish oil production have ended in failures. But as is witnessed by wildcats now under way or staked for immediate drilling, operators are undismayed by these negative results.

Most recent development planned for this area was the staking of a wildcat to be drilled some 6 miles southeast of South Cuyama production. The test will be jointly drilled by Honolulu Oil Corp., Oceanic Oil Co., and Wilshire Oil Co. Designated the Honolulu 1 Honolulu-Oceanic, site is in SW SW 19-9n-25w. Drilling is to start within 90 days.

The project is part of a large leasing venture in which Oceanic recently took over 3,400 acres from H. W. Dougherty. Of this block, Oceanic has assigned 1,160 acres to Shell Oil Co., 200 acres to The Texas Co., and 160 acres to Honolulu. Oceanic retained an override in these properties, which were in Section 29, 30, and 31-9n-25w.

In the eastern end of the valley, in 18-10n-24w and near the Kern County line, Richfield Oil Corp. was nearing 1,000 ft. at its 1 Caliente Unit. About 3 miles northeast of the projected Honolulu wildcat, Mohawk Petroleum Corp. has started its 48-2 Humble-Lundstrom in 2-4n-26w. Southeast of South Cuyama field some 2 miles, Rothschild Oil Co. is scheduled to start its 1 U. S. this week. Location of this wildcat is in 11-9n-27w.

At the extreme western end of Cuyama Valley, Seaboard Oil Co. is making preparations to drill an exploratory well on the Spanish Ranch. Located in 12-11n-30w, or about 9 miles west of Russell Ranch production, the test will be drilled on a farmout from General Petroleum Corp. The ranch consists of about 2,200 acres. Projected depth is to the Cretaceous, or about 4,500 ft., with spudding scheduled to start about June 15.

Two additional wildcats are under way also in the northwest area. Three miles northwest of the Superior discovery Hancock has spudded its 44-31 Hancock-Bishop, in NW 31-32s-20e. Northwest of Russell Ranch, and more or less between this production and the Morales sand discovery on farther northwest, Charles Holmes was below 1,000 ft. at his test in SE 23A-11n-28w.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Following the reef discovery by Honolulu and Seaboard in southeast Hockley County (see completions this week), locations have been made for two important wildcat tests on the west side of the Permian Basin. Bankline Oil Co. and Wilshire Oil Co. will drill 1 B. W. Hardy to 9,000 ft. in SE SE 23-JS-FL, 4 miles northwest of Lubbock, in Lubbock County. The other project is Sohio Petroleum Co. 1 W. T. Rodgers, a 10,000-ft. test located NW NW 144-12-EL, in northwest Lynn County, 6 miles north and 11 miles west of Tahoka.

NORTH TEXAS.—In southwest Stonewall County, Delta Gulf Drilling Co. and others 1 L. A. Sparks, 161-1-H&TC, recovered all shale in a core from 5,335-5,408 ft. and prepared to drill ahead until another break was encountered. Drilling had been stopped at 5,335 ft. when black shale cuttings began to show some limestone, which was thought might be the reef.

SOUTH LOUISIANA.—Deepest production to date on the Bay Marchand Dome has been found at The California Co. 3 State Lease 1,366, approximately 3 miles off Lafourche Parish, which opens a completely new area for the field. Twenty-eight feet of saturated oil sand was found at 6,272-300 ft.

ROCKY MOUNTAIN AREA.—Wildcats in the general Sussex area, Wyoming, are reaching interesting stages (see field report this week). Trigood Oil Co.'s 1 C&NW RR, 5-33n-75w, Muddy sand well at Glenrock is now flowing 75 bbl. of oil daily through choke. Wildcat locations are announced in the western Nebraska play with Ohio Oil Co. planning a test in the Grant area, Perkins County.

XUM

Southwest Texas

New Oil Discovery For Atascosa County

CORPUS CHRISTI.—Davis & Davidson 1 Tom Ventrcek has been completed for a new oil discovery 5 miles southwest of Jourdanton, John Neal Survey, Atascosa County. Through perforations at 1,531-34 ft., the well flowed 47 bbl. of oil daily through a ½-in. choke, with 30-40 psi. working pressure. The hole is bottomed at 1,534 ft., and operators set 5½-in. production casing at 1,534 ft. for completion attempt.

Shell Oil Co. is preparing to test the 1 Ben Korzekwa, a discovery well for Karnes County, on pump. On test made through perforations at 6,259-64 ft., using ⅝-in. top and ¼-in. bottom chokes, fluid rose to the surface in about 4 hours and the well was swabbed in, making 2 to 6 bbl. of oil per hour. Recovery was 3,600 ft. of 35.4°-gravity oil, 180 ft. of oil-cut mud, and some salt water. Bottom-hole flowing pressure was 300 psi., and the shut-in pressure 2,250 psi. This new discovery is located in the Louis Manchaca Survey, approximately 4 miles southwest of Falls City field.

H. R. Smith, F. William Carr, and W. E. Fox, Trustee, 1 Atlee Parr, new discovery well 7 miles south of Benavides, Duval County, flowed 105 bbl. of 47.7°-gravity oil daily through 8/64-in. choke on potential test. Test was made through perforations at 4,924-30 ft. On an earlier test, the well flowed 127 bbl. of 47.7°-gravity oil daily through perforations at 5,000-08 ft. This new discovery is located in Tract 1, Price Subdivision, San Andres Grant.

S. A. Brewster, W. O. Bartle, F. A. Gillespie & Sons 1 O. W. Killam, Webb County wildcat, is drilling below 12,780 ft. The well kicked at 12,675 ft. and operators ran electrical log to 12,680 ft., and cored greenish gray calcareous shale from 12,680-12-700 ft.

In the northern part of Duval County, Ralph E. Fair and Woodwar & Co. 1 C. W. Hahl, wildcat, cleaned gas and distillate through ½-in. choke from open hole at 7,590-7,610 ft. The wildcat, in Rodriguez Survey, Abstract 1,881, 2 miles northwest of Freer, cored gas sand from 7,573 ft. to total depth at 7,575 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Brooks County: Oil discovery, "Gruy"—Argo Oil Corp. C-1 Joseph Gruy Trust, J. G. Reynolds Sur. 152, 2½ mi. SW of Poquito Creek field, top pay 2,610 ft. (Dougherty sand), TD 3,810 ft., perf. 2,610-26 ft., IP 52 bbl. per day on pump, 25.5° grav.

Duval County: New oil discovery, "Atlee"—H. R. Smith, F. Wm. Carr, and W. E. Fox, Tr., 1 Atlee Parr, Tracts 1 and 2, W. E. Price O. & G. lease subdivision, San Andres Grant, 7 mi. S of Benavides, tubing completion, top pay 5,000 ft., TD 5,010 ft., perf. 5,002-08 ft., IP 127 bbl. oil per day, 9/64-in. choke, TP 575 psi., 47.7° grav., casing completion, top pay 4,900 ft., perf. 4,924-30 ft., IP 105 bbl. oil per day, 8/64-in. choke, 47.7° grav., CP 650 psi.

Jim Wells County: Gas discovery—W. B. Osborn 1 Mrs. Mittie Holshouser, Farm Block 96, 1 mi. SW of Alice, perf. 4,996-5,011 ft. (Seiler zone), TD 5,320 ft., IP 3,200,000 (dry gas) cu. ft. of gas, open flow, SIP 1,997 psi.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Bell County: Pryor Dillard 1 A. M. Cowan, John Morris Sur., 10 mi. SE of Belton, dry, TD 585 ft.

Duval County: John F. Camp & Sons and Chicago Corp. 1 Mucio Ruiz, V. Salazar Pre-emption Sur. 7, 2 mi. NW of Rosita townsite, dry, TD 3,324 ft.

Daubert & Achning 2 J. M. Bennett, CEPI&M Co. Sur. 37, A-196, 15 mi. W of Benavides, dry, TD 3,985 ft.

Guadalupe County: J. A. Caldwell 1 Emil Borchers, Sequin area, A. M. Esnaurrizar Grant, 6 mi. NW of Sequin, dry, TD 1,305 ft.

McMullen County: Goldston Oil Corp. 1 Nueces Land & Livestock Co., BS&F Sur. 117, A-121, 14 mi. NW of Freer, dry, TD 1,543 ft.

Nueces County: McFarland et al 1 Ed Jurica Estate, Sur. 15, 3½ mi. SW of Corpus Christi, dry, TD 4,856 ft.

Webb County: Houser & Campbell 1 Rosa Benavides, Sur. 659, 9 mi. N of Bruni, dry, TD 2,407 ft.

Zapata County: Don H. Marsh et al, 2 Julian Ramirez et al, Block 14, Share A, Villa Grant, Thos. Burtran Sur. 627, dry, TD 1,002 ft.

Louisiana-Arkansas

Catesville Cotton Valley Has Smackover Prospects

SHREVEPORT.—When C. H. Murphy & Co. 1 Sue Olson, second producer in Catesville Cotton Valley field of Union County, Arkansas, was having difficulties shutting off salt water and had very little oil, some observers reported the new field would be of limited size. Later the 1 Olson completed from two sections of the Stray sand, flowing 150 bbl. of oil a day through tubing from perforations at 6,512-21 ft., and 178 bbl. of oil a day through casing from perforations at 6,586-94 ft.

The same operators skidded rig over to the 2 Sue Olson for a west offset to the No. 1, in approximately NW NE 32-18s-15w, and had prospects of a well in the Smackover formation. Tests in higher zones, if any, were not reported. Cores from 7,711-21. recovered 5 ft. of hard lime with no shows and 5 ft. of porous oolitic lime with a show of oil. A 16-minute drill-stem test from 7,713-21 ft., using ¼-in. chokes and 2,000 ft. of water cushion, recovered 250 ft. of oil under bottom-hole flowing pressure of 3,325 psi. Total depth was 7,779 ft.

Petersen Drilling Co. 1 Womack & Cotton, 1-6n-6e, deep test in Willow Lake field of Catahoula field, was plugged back from 9,709 ft. to 5,324 ft. in the Wilcox. First perforations from 5,075-77 ft. were squeezed without testing.

Continental Oil Co. 1 Wideman, NW SE 21-21n-7w, new 7,000-ft. wildcat in Claiborne Parish, was below 1,780 ft. on first report. Location is on a subsurface prospect.

Stanolind Oil & Gas Co. 1 G. W. Meadors, NE NW 8-22n-5w, Claiborne Parish, cored shale and lime with no shows, in the Pettit from 6,168-5,218 ft. It was waiting on cement after setting 9⅝-in. casing at 5,297 ft. Top on the Sligo was 5,092 ft., and Travis Peak 5,278 ft., on elevation of 267 ft. It was projected to 11,500 ft.

Unofficial information on Jack Manning 1 Sabine Lumber Co., Paluxy wildcat 2 miles north of Zwolle field in 13-8n-13w, Sabine Parish, reported total depth at 3,622 ft. in the Paluxy. Casing was being run.

One mile southeast of Lake Bruen, Tensas Parish, David M. Lide 1 State-Harris "Unit," 40-12n-12e, was drilling in the upper Cretaceous at 7,620 ft. It has had no shows.

T. L. James & Co. 1 Burden, 36-23n-2w, was drilling in the Cotton Valley at 6,310 ft.

NORTH LOUISIANA WILDCAT FAILURE

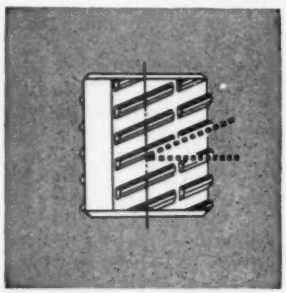
Catahoula Parish: Roy L. Fisher 1 Zenoria Lumber Co., NW NE NW 27-8n-6e, dry, TD 6,010 ft., Cockfield 1,294 ft., Cook Mountain 1,863 ft., Sparta 2,100 ft., Cane River 2,913 ft., Talahatta 3,226 ft., Wilcox 3,310 ft., 61 side-wall cores 2,188-5,856 ft. had no shows.

ARKANSAS WILDCAT FAILURE

Ouachita County: C. E. Miller 1 George Smith, approximately SE NE 34-13s-18w, dry, TD 1,447 ft., Nacatoch 1,370 ft.

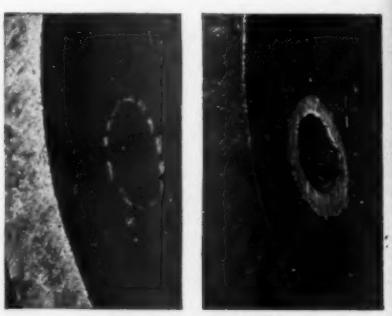
SECURITY CASING SCRAPER MAY BE RUN THREE WAYS

Casing is scraped clean when the Security Casing Scraper is run on either (1) wire line, (2) tubing, or (3) drill pipe. This is possible because it is the only scraper whose cutter teeth contact 360° of the casing circumference at all times. Multiple teeth positively clean every inch of casing with rotary or vertical movement. For example, on the 7" Security Casing Scraper, there are 24 individual shearing teeth which form a total of 98 linear inches of cutting surface. The teeth act upon an obstruction approximately 800 times under average operating conditions.



Reversible Cutter

Tool design and construction is simple and maintenance is easy. Each cutter is held against the casing by three strong coil springs, which exert an even pressure between cutter and mandrel.
The helical teeth on the four opposed, spring loaded cutters produce shearing action which cleans casing quickly, cutting away all burrs or foreign material. Reversible cutters give extra service life.



Perforation Burrs Removed Cleanly

Unretouched photograph of gun perforation before and after removing burrs with Security Casing Scraper. Photo on right shows burr is actually cut (sheared) away, not crushed or broken. For economical scraping, specify Security.

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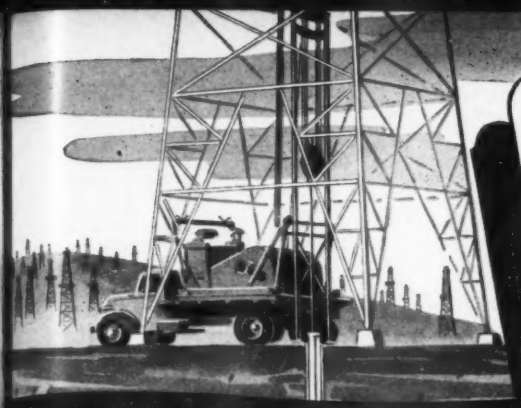
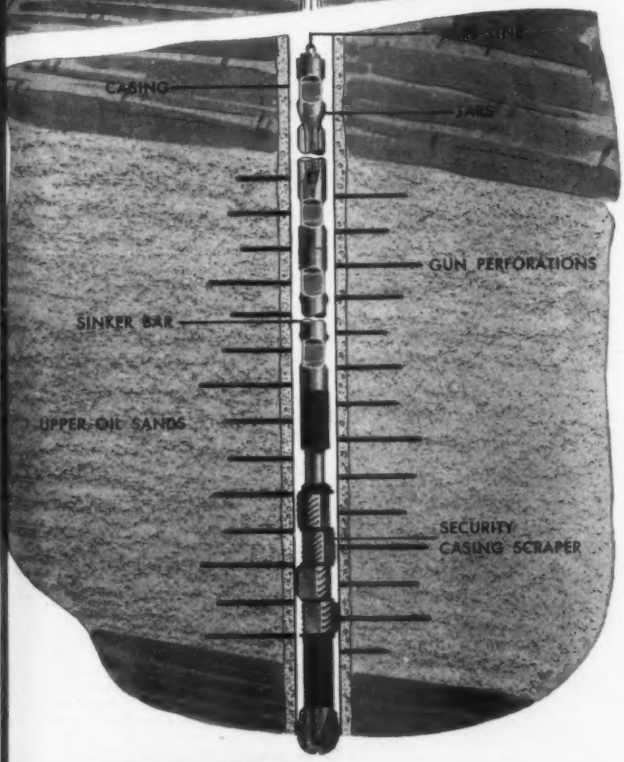


LOCATION: Lake Creek

WELL HISTORY: Depleted production required recompletion at upper pay zone. Gun perforated at 10,000 feet opposite new pay.

PROBLEM: Economically scrape casing perforations without rotary equipment.

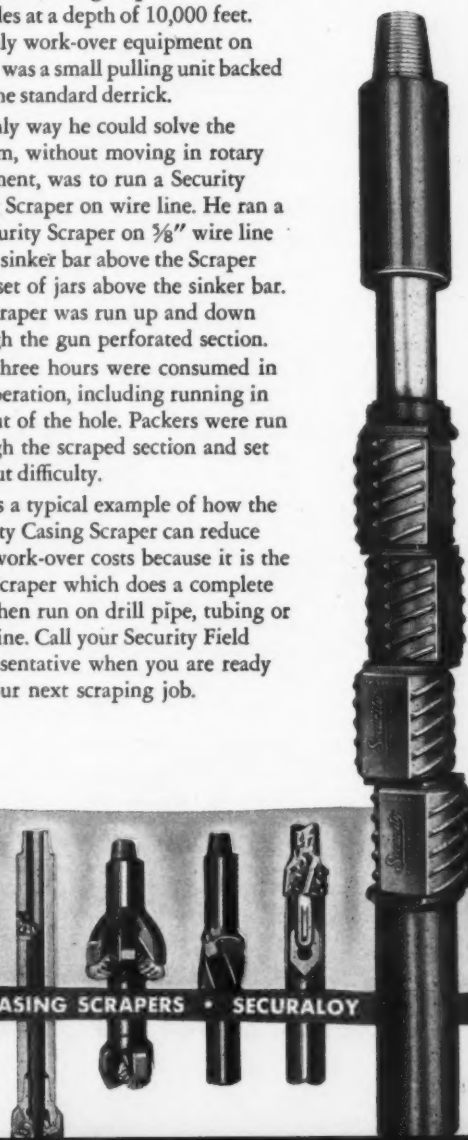
How would you Scrape Casing Without a Rotary?



The production superintendent of a large oil company was faced with the problem of scraping 7" casing which had been gun perforated with 150 holes at a depth of 10,000 feet. The only work-over equipment on the job was a small pulling unit backed up to the standard derrick.

The only way he could solve the problem, without moving in rotary equipment, was to run a Security Casing Scraper on wire line. He ran a 7" Security Scraper on 5/8" wire line with a sinker bar above the Scraper and a set of jars above the sinker bar. The scraper was run up and down through the gun perforated section. Only three hours were consumed in this operation, including running in and out of the hole. Packers were run through the scraped section and set without difficulty.

This is a typical example of how the Security Casing Scraper can reduce your work-over costs because it is the only Scraper which does a complete job when run on drill pipe, tubing or wire line. Call your Security Field Representative when you are ready for your next scraping job.



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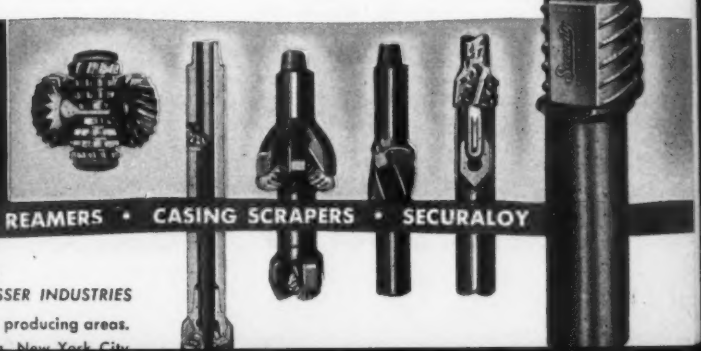

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XUM

North Central Texas

Wildcat Activities Continues In Stonewall County

WICHITA FALLS.—C. L. Norsworthy, Jr. 1 C. D. Wiley, 44-G-Alice Stephenson Survey, Bend conglomerate discovery in northeast Stonewall County, made completion potential of 916 bbl. of oil a day from pay at 6,001-10 ft., total depth. Operators ran a second potential test, which gaged 226 bbl. of oil in 6 hours, through ¾-in. choke. Flowing pressures were 600 psi. on casing and 175 psi. on tubing.

Gene Goff and others 1 Beulah Branch, 7,000-ft. wildcat in southwest Stonewall County, was to be located 660 ft. from south and west lines, north half, Section 356-2-H&TC, 12 miles north of Rotan. Location is 3 miles north of Sun Oil Co.'s 1 Beulah Branch, last reported drilling below 5,910 ft.

Seaboard Oil Co. 1 W. I. Martin, 4-U-T&P, south-central Stonewall County wildcat, drilled to 6,514 ft. and ran electrical surveys. A drill-stem test from 6,240-6,330 ft. recovered 60 ft. of mud. Corrected top on the Hickory sand was 6,504 ft., and 6,222 ft. on the Ellenburger. Operators plugged back to 5,520 ft. to test a Canyon sand around 5,401-5,520 ft. A 2-hour drill-stem test from 5,401-17 ft. had recovered 130 ft. of very heavily oil and gas-cut mud.

In Throckmorton County, 12 miles west of Woodson, Fred M. Manning, Inc. 1-A Putnam Estate topped the Mississippian at 4,576 ft. Drill-stem tests at 4,576-96 ft. and 4,596-4,616 ft. recovered mud with no shows. Then from 4,616-36 ft. gas showed in 11 minutes, and in 1 hour recovery was 125 ft. of free oil, plus 6 ft. of heavily oil and gas-cut mud. Operators set pipe to 4,614 ft. and were waiting on cement. Total depth was 4,636 ft.

In southeast Fisher County, Roeser & Pendleton 1 Mose Newman Industries, 8-20-T&P, ran a 2-hour drill-stem test in Strawn from 5,600-33 ft. after getting shows of oil while drilling. Gas showed in 10 minutes and fluid filled the hole at the rate of 480 bbl. per day. Recovery was 2,750 ft. of clean oil, plus 250 ft. of oil and gas-cut mud, with no water. Flowing pressure was 600 psi., and 30-minute shut-in pressure was 2,150 psi. The well logged sandy lime at 5,600-13 ft and sand from 5,613-33 ft., which was correlated 90 ft. high to Sun Oil Co. 1 Johnson, 2½ miles to the northwest.

Buz Morgan 2 O'Neal, Mary Waugh Survey, second test for Buz field of Parker County, 3½ miles northwest of Springtown, had prospects of a new pay in the Caddo limestone. Location is 900 ft. south of the Ellenburger discovery. Top of the Caddo was 3,495 ft., with first saturation around 3,748 ft. From 3,748-68 ft. there was saturation but no gas, and from 3,768-84 ft., total depth, there was additional saturation and gas. Casing had been set to 3,748 ft. on the cable-tool operation, and plug was expected to be drilled by week's end. At the time casing was set, it was reported to have some 400 ft. of oil standing in the hole. Operators were to shoot with nitro when plug has been drilled.

NORTH TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: Reno Oil Co. 1 Wilson Peterson, Lot 991, Tract 990, 8½ mi. SE Holliday, TD 4,007 ft., pay 3,732 ft., shot 3,768?-8 ft., pumped 35.7 bbl. of 41°-gravity oil a day, GOR 380 cu. ft.

Coleman County: Fred Pool 1 J. G. Copeland, Sec. 62, H&TC, ¼ mi. S Santa Anna, TD 1,800 ft., pay 1,792 ft., 8,376,000 cu. ft. of gas, SIP 870 psi.

Comanche County: Sohio Petroleum Co. 1 Stella M. Summers, Blk. 24, Lampasas CSL A-607, 3 mi. NW Sidney, TL 2,530 ft., elev. 1,640 ft., Mississippian 2,485 ft., flowed 104 bbl. of 39.8°-gravity oil a day, 20/64-in. choke, GOR 319 cu. ft., CP 440 psi., TP 50 psi.

Cooke County: Broadway Drilling Co. and Redman Bros. 2 J. Wheeler, R. Ledbetter Sur., A-801, 5 mi. NE St. Joe, TD 2,391 ft., Strawn pay 2,385 ft., flowed 47.5 bbl. of 42°-gravity oil in 8 hr., ¼-in. choke, CP 100 psi., TP 40 psi.

Eastland County: Bankline Oil Co. 1 Mrs. Briggs Owen, 48-4-H&TC, 3½ mi. W Eastland, TD 3,952 ft., elev. 1,499 ft., PB 3,306 ft., pay 3,277 ft., flowed 100 bbl. of 41°-gravity oil in 6 hr., 20/64-in. choke, GOR 848 cu. ft., CP 390 psi., TP 310 psi.

Knox County: Lake Creek Oil Co. 1 Emma Cooksey, 6-2-D&W, TD 1,630 ft., elev. 1,357 ft., sand pay 1,610 ft., pumped 50 bbl. of 37°-gravity oil a day, GOR 150 cu. ft.

Montague County: B. F. Phillips 1 W. M. Brooks, Sec. 10, MEP&P Sur., A-517, 3 mi. S Nocona, TD 5,911 ft., elev. 1,037 ft., conglomerate pay 5,881 ft., flowed 36 bbl. of 42°-gravity oil a day, 12/64-in. choke, GOR 700 cu. ft., CP 300 psi., TP 400 psi.

The Texas Co. 1 P. E. Boedecker, NW NW Sec. 2,852, TE&L Sur., 4 mi. NW Bowie, TD 7,164 ft., PB 6,825 ft., Viola lime pay 6,800 ft., flowed 145.5 bbl. of 43.9°-gravity oil a day, ¼-in. choke, GOR 1,375 cu. ft., CP 875 psi., TP 425 psi.

Stephens County: G. B. Cree 1 W. H. Green "B," A. J. Roe Sur., 19 mi. W Breckenridge, TD 4,700 ft., PB 3,677 ft., elev. 1,300 ft., Caddo 3,573 ft., perf. 75 shots 3,572-92 ft., 3,000,000 cu. ft. of gas a day, SIP 1,457 psi.

NORTH TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Bridwell Oil Co. 2-K L. F. Wilson, Blk. 62, ATNCL, 2 mi. NE N. Chalk Hill field, dry, TD 4,170 ft.

Weldon Guest and K. W. Mulligan 1 J. Langley, Joseph Levins Sur., A-260, 10 mi. SE Archer City, dry, TD 866 ft.

T. A. Norwood et al 1 C. & W. Mankins, Sec. 2, SPRR Sur., A-944, 1 mi. E Mankins, dry, TD 1,827 ft.

C. L. Shive 1 Falls County School Lands, Blk. 42, Falls CSL, A-130, 6 mi. N Olney, dry, TD 1,301 ft., Gunsight 1,33-35 ft.

Clay County: W. B. Hamilton 1 Harding, MEP&P Sur., A-350, 2 mi. SW Petrolia, dry, TD 1,850 ft., show of oil 1,723-29 ft.

Coleman County: Anzac Oil Corp. 1 Curtis A. Jameson, J. L. Bouldin Sur. 152, 5 mi. SW Santa Anna, dry, TD 1,906 ft., water sand 1,900 ft.

Gene Shirley 1 S. A. Yancy, M. D. J. Trevino Sur. 668, 4 mi. E Coleman, dry, TD 740 ft.

Comanche County: Sohio Petroleum Co. 1 Pink Scott, D. H. McFadden Sur. A-647, 9 mi. NE Sidney, dry, TD 3,118 ft., elev. 1,334 ft., Marble Falls 2,602 ft., Barnett 2,958 ft., Ellenburger 3,041 ft.

Cooke County: Bridwell Oil Co. 2 J. F. Flusche "C," J. Clark Sur., A-194, 5 mi. N Muenster, dry, TD 1,671 ft.

Eastland County: Bruce L. Hoover 1 F. A. Weir, Blk. 11, D. S. Richardson Sur., A-414, 9 mi. NE Gorman, dry, TD 3,194 ft., elev. 1,772 ft., broken lime with oil show 3,069-88 ft.

Haskell County: A. J. Bankhead 1 C. R. Elliott, 136-45-H&TC, 3 mi. N Weinert, dry, TD 5,488 ft., elev. 1,496 ft.

Jack County: Bolin Oil Co. and Warren Oil Corp. 1 Johnson, Stoneman Sur., A-1183, 6 mi. NW Jacksboro, dry, TD 3,508 ft.

Jones County: Blackwell Oil & Gas Co. 1 Alexander, Sec. 2, Blk. 8, E. C. Miller Sur., 4 mi. SW Leuders, dry, TD 3,455 ft., King sand 2,040 ft., had some oil-cut mud on DST.

W. P. Carr 1 K. J. Rister, B. M. Clopton Sur. 244, 2 mi. S Hawley, dry, TD 2,410 ft., elev. 1,667 ft., Saddle Creek 1,952 ft.

Lampasas County: H. C. McAnley 1 Dorothy Hardy May, Willis Avery Sur., 10 mi. W Lometa, dry, TD ~,650 ft., elev. 1,200 ft., Ellenburger 702 ft.

Mills County: Bee Gutowsky, Inc. 1 P. R. Reid, Sec. 19, HT&B Sur., 1 mi. NW Goldthwaite, dry, TD 1,225 ft.

Nolan County: Sun Oil Co. 1 Beatrice K. Stone, NE NW 77-X-T&P, 11½ mi. SW Sweetwater, dry, TD 6,819 ft., elev. 2,551 ft., Palo Pinto 5,780 ft., Strawn 5,940 ft.

Shackelford County: McElroy Ranch Co. 1 C. C. Gillean, Fucunda Ortego Sur. A-215, 10 mi. NE Albany, dry, TD 4,529 ft., elev. 1,277 ft., Palo Pinto 1,888 ft., Caddo 3,687 ft., Barnett 4,356 ft., Chester 4,431 ft., Ellenburger 4,483 ft.

Wichita County: George W. Graham 1 Vaughan heirs, Blk. 76, Red River Valley Lands, 1¾ mi. NW Burkburnett, dry, TD 2,492 ft.

H. S. Grace 1 Slaughter, Sec. 9, GC&SF Sur., A-361, 3½ mi. E Electra, dry, TD 2,223 ft., elev. 1,143 ft., lime 2,062 ft.

Greenspan & Sunshine 1 Goetze Bros., SA&MG Sur., A-269, 3 mi. SE Clara, dry, 2,004 ft.

Young County: Russell Maguire et al 1 W. B. Howard, Sec. 215, TE&L Sur., 3 mi. SE Olney, dry, TD 5,102 ft., Caddo 4,197 ft., Mississippian 4,998 ft.

California

325-Bbl. Producer Completed at Signal Hill

LOS ANGELES.—Completion of a 325-bbl. producer from a shallow pay in the Signal Hill area of Long Beach is causing a revival of drilling activity in this famous old field. At last weekend, rigs already were drilling on nine nearby townlot sites in an attempt to determine the extent of the accumulation. Consensus is that it is a result of faulting and the productive area will not be large.

Activity is fairly well confined to Section 30-4s-12w, near the intersection of Cherry and Burnett avenues. In recent weeks two small pumpers, one a recompletion, had been completed in a 2,300-ft. sand without undue excitement. However, when J. C. Rogers completed the 1 Enterprise for a pumping-flowing production of about 325 bbl. daily, activity at once increased. Production was from a zone at 2,306-2,404 ft., gravity was 21.8° A.P.I. and the cut was 0.1 per cent.

Subsequent to the completion of the 1 Enterprise, Union Oil Co. recompleted an adjacent 20-year old producer in the shallow zone. The plugged-back producer, its 20 Long Beach Community, was producing through perforations at 2,230-2,320 ft. It was completed as a 250-bbl. pumper.

In the Antelope Hills area of Kern County, Shell Oil Co. is attempting to complete its 63-X-23 "well" as a new oil discovery. The potential pool opener, located in Section 23-27s-19e, was started as a core hole but after being carried to 3,252 ft. was changed to a larger hole.

A drill-stem test at 2,783-2,810 ft., with the tool open 1 hour and 12 minutes, recovered 25 ft. of oil, 402 ft. of oily gas-cut water and 140 ft. of oily mud. Five and one-half-inch casing then was set at 2,360 ft., perforated between 2,267-2,360 ft. and cemented through perforations at 2,262 ft. At last reports hole was being cleaned out.

Site of the wildcat is about 1 mile northeast of a gas discovery made in June 1949 by Independent Exploration Co. This discovery, the 83 Bolton, was carried to a total depth of 4,313 ft. and then completed as a 2,000-M.c.f. daily gas producer from a sand at 3,203-39 ft. Location of the gas producer is in Section 27-27s-19e.

The potential shallow-pool opener west of the town of Castaic in Los Angeles County has encountered water difficulties so that its potentialities are somewhat obscure. The wildcat, Macson Oil Co. 1 Radovich, encountered some 260 ft. of oil sand between 490 and 900 ft. Casing was perforated at 494-619 ft. and 662-895 ft. but flow and pumping tests yielded largely water. Water-locator surveys indicate the point of entry to be near the bottom. If continued pumping fails to improve the situation, hole may be plugged back into the blank section between 619-662 ft. Gravity of the crude is about 19° A.P.I.

CALIFORNIA WILDCAT FAILURES

Kern County, Comanche Point area: L. C. Gould 31-1 Tejon, 31-32s-30e, dry, Santa Margarita 1,020 ft., TD 1,863 ft., elev. 921 ft.

Lost Hills area: General Pet. Corp. 33-11 Williamson, 11-26s-20e, dry, TD 11,553 ft., elev. 480 ft.

McFarland area: Atlantic Oil Co. 1 Del Fortuna, 21-26s-26e, dry, Vedder 5,680 ft., Famosa sand 6,763 ft., TD 6,850 ft., elev. 490 ft.

Midway-Sunset area: Richfield Oil Corp. 1 Osborn, 34-12n-23w, dry, TD 9,137 ft., elev. 536 ft.

Tejon Flats area: Standard Oil Co. of Calif. 65-Tejon Ranch-4, 8-11n-18w, dry, Santa Margarita 1,226 ft., Reserve sand 2,182 ft., basement 2,585 ft., TD 2,593 ft., elev. 739 ft.

Los Angeles County, Castaic area: Bolsa Chica Oil Corp. 43-18 Kinler, 18-5n-16w, dry, TD 2,529 ft., elev. 1,446 ft.

Sylmar area: Dohney - Battson - Lytle 1 Sombrero-Stetson, 21-3n-15w, dry, TD 8,250 ft., elev. 1,422 ft.

San Benito County, Ciervo anticline area: R. F. D. Co. No. 1 well, 33-16s-12e, dry, TD 1,268 ft., elev. 1,472 ft.

San Luis Obispo County, Arroyo Grande area: C. W. Colgrove 1-4 Elberta, 4-32s-13e, dry, TD 3,271 ft., elev. 500 ft.

Santa Barbara County, Cuyama Valley area: A. A. Cameron 22 Hill Bros., 27-10n-27w, dry, Santa Margarita 2,400 ft., TD 5,020 ft., elev. 2.580 ft.

Mississippi

Operators Installing Pumps On Adams County Test

JACKSON.—Plains Production Co. 1 W. C. Walker, new Wilcox discovery, 11-5n-2w, Adams County, is now shut in wating on storage and potential test. Casing was perforated at 6,654-56½ ft. and drill-stem test was run with packer set at 6,640 ft. In 14 hours, the well flowed 117 bbl. of 42°-gravity oil through ¼-in. choke. Top pressure was 130 psi. Operators are installing pumping equipment because pressures are low and it is doubtful whether well will flow naturally. This well encountered a total of 23 ft. net oil sand in four zones of the Wilcox. Operators perforated the deepest zone for completion.

Barnett Serio - Petersen Drilling Co. 2 H. R. Jenkins, 19-5n-3w, has been completed as a confirmation test to the new Glen Aubin field, Adams County. On potential test, this well flowed 82 bbl. of 44°-gravity oil per day through a ⅛-in. choke, with tubing pressure of 400 psi. Production is through perforations at 6,684-88 ft. in the Wilcox. This sand is 154 ft. lower in the Wilcox section than the producing sand in the field discovery well, J. D. Reese 1 Armstrong, located 1,900 ft. north of the 2 Jenkins.

At Flora field, Madison County, Gulf Refining Co. will drill a 9,500-ft. test to the "Wilson Deep" sand of Lower Cretaceous age, and it is reported there is a possibility that the test will be carried to the Smackover. Location is in NW NW 2-8n-1w, on the Anderson fee. This play is being made on the strength of the deeper pay possibilities indicated by the Carter well at Pickens field.

In Stone County, George Vasen is coring at 16,905 ft. in his 1 fee, 9-2s-11w. This wildcat was spudded in August 1946, and abandoned in November of the same year at total depth of 11,209 ft. Operations were resumed in August 1947, with the well being shut down for several months during 1948 and 1949. The well now has a string of 7-in. casing set to 14,038 ft. Extensive coring and testing has been done in the well, which is the deepest well drilled east of the Mississippi River.

MISSISSIPPI WILDCAT FAILURES

Adams County: Humble Oil & Refining Co. 2 Mrs. Roane F. Byrnes, 13-5n-3w, dry, TD 7,500 ft.

Lincoln County: Southeastern Drilling Co. and S. P. Borden 1 Boone, 34-7n-9e, dry, TD 11,010 ft.

South Louisiana

Deepest Production Opened In Bay Marchand Field

NEW ORLEANS.—In Bay Marchand field, offshore from Lafourche Parish, The California Co. has opened the depest production to date on the dome at its 3 State Lease 1,366. Twenty-eight feet of saturated oil sand was found at 6,272-6,300 ft. in the well, which opens a new area for the field, which, so far, is the leading tidelands oil producer. The well came in for 348 bbl. of crude oil daily through a 13/64-in. choke, flowing under a pressure of 1,100 psi. Located approximately 1 mile east of the farthest eastward production, the new producer is the third test to be drilled off the "F" platform. The company's 1 and 2 tries on State Lease 1,366 were dry. The first try was a straight hole; the second was deviated to the northwest and the third was deviated to the southeast.

In the newly discovered South Pass area Block 24 field, offshore from Plaquemines Parish, Shell Oil Co. has tested oil in a new, deeper zone in its 2 State Lease 1,008, southwest offset to the discovery well for the field. Through perforations at 8,054-60 ft., the well flowed 201 bbl. of 29.6°-gravity oil and developed 4,710 psi. working pres-

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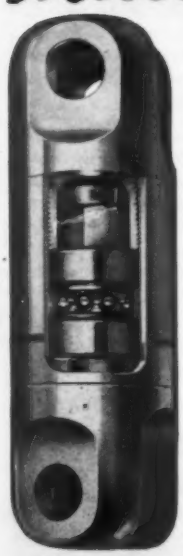

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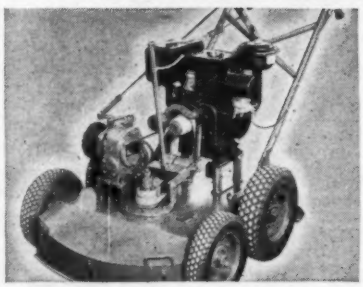

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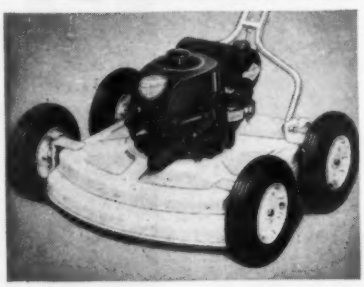

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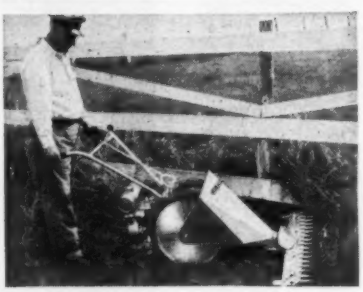

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sure. Bottom-hole flowing pressure was 3,720 psi. Operators squeezed these perforations and are preparing to retest. Hole is bottomed at 9,688 ft. The discovery well is flowing through perforations at 6,530-34 ft.

Hassie Hunt Trust 1 John Herman Schultz et al, outpost test in the new Maxie field, Acadia Parish, is preparing to perforate and test lower zones after initial test in the regular field pay level failed to bring production. The well was drilled to a depth of 11,714 ft. and 5-in. liner was set through the lower sands picked up in the well. Initial perforations were made at 10,577-87 ft.; however, test recovered only three stands of mud.

In its third successful well in newly discovered Romere's Pass field, The California Co. 3 Romere's Pass has been completed in a new deep sand. Located in 22-20s-19e, Plaquemines Parish, the well was perforated at 9,806-20 ft. and reported a flow of 333 bbl. of oil daily through a 9/64-in. choke. Production in the initial two wells is taken from the 9,000-ft. sand.

SOUTH LOUISIANA WILDCAT FAILURE

Lafourche Parish: Atlantic Refining Co. 1 Ida Rogers, 36-17s-18e, 4 mi. NW of Bourg townsite, dry, TD 12,600 ft.

Michigan

Mercer Gets Big Gasser In Oceana County

MOUNT PLEASANT. — Mercer Oil Co., Inc., logged 310,000 cu. ft. of gas in the Reed City-Monroe zone at 2,231 ft at company's 1 Schlee, NE NE SE 15-16n-17w, Weare Township wildcat, Oceana County, a test located 2 miles southeast of the nearest oil producer in Pentwater field. About 125 ft. of salt water was showing with the gas over an 8-hour period. Well was being drilled ahead. Top of Reed City zone was picked at 2,223 ft. Gas first started to show at 2,225 ft. where flow was estimated at 150,000 cu. ft. Deepened to 2,231 ft., flow was gaged at 310,000 ft. Both the Traverse, logged at 1,620 ft., and the Dundee, topped at 2,151 ft., were dry.

Brazos Oil & Gas Co. F-2 State-Norwich, NW SE SW 6-24n-6w, Norwich Township wildcat, Missaukee County, located just over a mile southeast of the Brazos Traverse gas-discovery well in Pioneer Township, Missaukee County, was being cased with 7-in. at 3,000 ft., total depth, in the Traverse prior to perforation and test of one or more porosity zones recorded on microlog survey.

Traverse lime top was picked at 2,769 ft. Porosity was indicated on survey at 2,772-78 ft., and possibly at 2,778-96 ft. The upper porosity zone may have carried oil and gas shows.

Mercer Oil Co., Inc., reported that a small show of oil and gas was logged at 1,273 ft., 2 ft. in the Traverse lime at company's 1 Wallace, SW SW SW 1-24n-15w, Pleasanton Township wildcat, Manistee County. Completion and tests were being made below 1,277 ft. It did not appear that oil show was commercial at 1,273 ft., however. This wildcat is one of several core-exploratory tests scheduled to be drilled by Mercer in the Benzie-Manistee counties area, on a block which was farmed from the Texas Co.. when that firm left Michigan earlier this year. Texas was reported to have core drilled the area last summer.

MICHIGAN WILDCAT FAILURES

Allegan County, Clyde Township: Ford Oil Co. 1 Drozd, NE NW NE 31-2n-15w, Traverse 1,210 ft., dry, TD 1,217 ft.

Missaukee County, Aetna Township: Brazos Oil & Gas Co. 1 State-Aetna, C NE 27-22n-6w, Stray sand 1,332 ft., dry, TD 1,343 ft.

Clam Union Township: Taggart Bros. Gas Co. 2 DeBree-Diemer et al, SW 19-21n-6w, Stray sand 1,408 ft., dry, TD 1,420 ft.

Newaygo County, Sheridan Township: Os-

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ceola Refining Co. 1 Westra, SE NE SE 13-12n-14w, Traverse 2,238 ft., dry, TD 2,239 ft.

Texas Gulf Coast

Gas Discovery Completed In Live Oak County

HOUSTON.—Ten miles northwest of Tynan, Live Oak County, S. H. Howell has completed the 1 Joe Doubrava for a gas discovery. Through perforations at 3,959-65 ft., the well flowed 130,000,000 cu. ft. of gas daily on open-flow test, with shut-in pressure at 1,568 psi. Through a ¼-in. choke, the well flowed 2,290,000 cu. ft. of gas daily with tubing pressure of 1,483 psi. The new discovery is located in the Refugio County School Land Survey, Abstract 399.

A major extension to Goose Creek field, Harris County, has been completed at the Production Service Oil Corp. et al 1 Tavary, Harvey Whiting Survey, Lot 9, Pelly Acres, city of Baytown. The new producer came in flowing 82 bbl. of 21.2°- gravity oil daily through a 7/64-in. choke, with flowing pressure on the tubing at 1,125 psi. The well was drilled to a depth of 5,207 ft. and has 5½-in. casing set to 4,312 ft. Production is through perforations at 4,258-68 ft.

Approximately 5 miles northeast of Cat Springs, Austin County, G. S. Hammonds 1 Walter Schneider, discovery prospect, is preparing to perforate around 10,700 ft. for completion attempt. Drill-stem tests have indicated production at several levels below the 10,000-ft. mark. Test at 10,067-72 ft. recovered five stands of oil and two and one-half stands of oil-and-gas-cut mud. Test at 10,090-10,122 ft. recovered mud cut with gas, and test at 10,329-10,640 ft. recovered four and one-half stands of oil and gas-cut mud. The prospective discovery is in the James Cummings Survey, Abstract 31.

Morris Canna, Texita Oil Co. and Alaska Steamship Co. tested 75 bbl. of oil daily from open hole at 4,184-87 ft. in the 1 Mary Shumbera, new oil discovery, Bee County School Land Survey 16, Abstract 102. The new oiler is located 1,650 ft. north-northwest of Producers Corp. of Nevada 1 Karsch, a gas-discovery well.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCAT

Brazos County: Gas discovery, Millican Dome—Marshall Stone & C. H. Bass 1 Wharton Weems, J. M. Barrera Sur., A-67, 1¼ mi. NW of Millican townsite, top pay 3,101 ft., perf. 3,101-09 ft., TD 4,000 ft., IP 7,700,000 cu. ft. of gas, open flow.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Calhoun County: A. J. Bankhead et al 1 F. J. Roemer Estate, I&GN RR Co. Sur. 1 and 2, 1¼ mi. NE of Long Mott field, dry, TD 9,354 ft.

DeWitt County: Hewit & Dougherty 1 A. Nau, Henry Clark Sur., 6 mi. S of Yorktown, dry, TD 8,720 ft.

Goliad County: Houston Oil Co. 1 Eugene Dorsey et al, Melrose area, James Cunningham Sur., A-4, dry, TD 8,850 ft.

Harris County: John S. Neilson 1 Maurice Hirsch et al, J. W. Asbury Sur., A-91, 6 mi. NE Humble, dry, TD 8,801 ft.

Victoria County: Quintana Petroleum Co. 1 Laura A. Fagan et al, J. M. & I. Valdez Sur., 2 mi. S of E. McFaddin field, dry, TD 7,525 ft.

Waller County: Superior Oil Co. 1 Guy T. Pattison et al, J. McFarland Sur., A-46, Brookshire dome, dry, TD 5,066 ft.

Wharton County: Butcher-Arthur, Inc. 1 Kirk F. Perkins, ETRR Co. Sur. 1, A-109, 1½ mi. E of Hillje, dry, TD 6,510 ft. Robert Flanagan & William Perlman 1 D. P. Redwine Est., ET RR Co., Sur. 19, 6 mi. S of Pierce, dry, TD 7,315 ft.

Appalachian Field

Wood County Wildcat Is Good Gas Well

PITTSBURGH.—In Steele district, Wood County, West Virginia, Columbian Carbon Co. completed the 1-GW-1143 Godfrey L. Cabot, Inc. (J. A. Ruble Tract), elevation 908 ft., gaging 13,179,000 cu. ft. of gas, natural. The following tops were listed: Corniferous lime 5,046 ft., Oriskany sand 5,160 ft., gas 5,162-77 ft. Total depth was 5,177 ft. Rock pressure was 1,225 psi. in 60 hours. The company started work at a new location, its 1-GW-1148 Godfrey L. Cabot, Inc. (Milton McLane Tract), elevation 788 ft., on the Belleville Quadrangle 1.20 miles south Latitude 39° 05′, and 2.85 miles west of Longitude 81° 30′. This well is drilling at 641 ft. In Tucker district, Wirt County, in this section, Glen W. Roberts 1 Forrest Daugherty Estate, elevation 1,066 ft., was dry; Corniferous lime 5,244 ft., Oriskany sand 5,383 ft., show of gas 5,386 ft., water 5,386-89 ft., total depth 5,389 ft. In Portland district, Preston County, W. E. Snee located his 3 Cora E. Lewis, elevation 2,089 ft., on the Kingwood Quadrangle, 5 miles south of Latitude 39° 30′ and 3.8 miles west of Longitude 71° 30′.

In Napier Township, Bedford County, Pennsylvania, South Penn et al, Snee & Eberly 1 Jesse B. Miller, elevation 1,666 ft., are drilling by tools. The depth of the hole is 7,255 ft. In Georges Township, Fayette County, Orville Eberly et al 1 N. E. Mur-

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Above Left: Going back in after drill stem testing distillate on Arrow Drilling Co. Rig 17 in Lindsay Field, Garvin County, Oklahoma. In the foreground are Engineer S. E. Hudson, and Crewmen W. E. Hites and K. W. Keenan. Supervising are Tool Pusher L. E. "Mac" McConnell (left), and Driller W. W. "Woody" Moore. Derrickman (not shown) is Ray Satterwhite.

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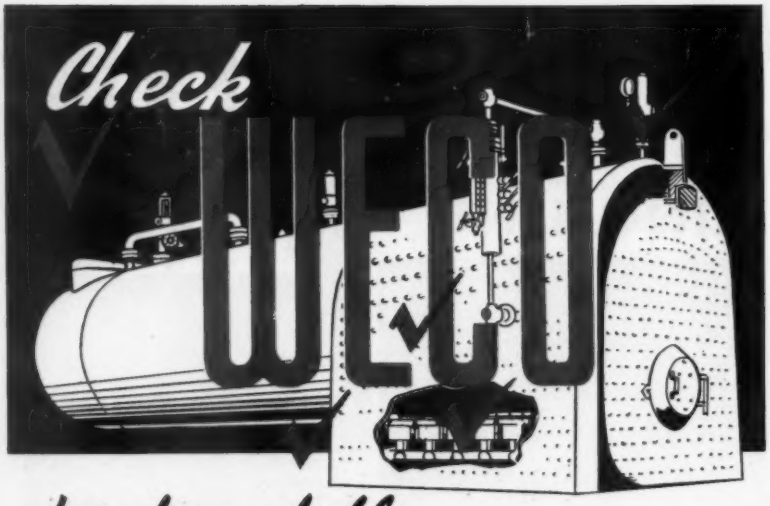

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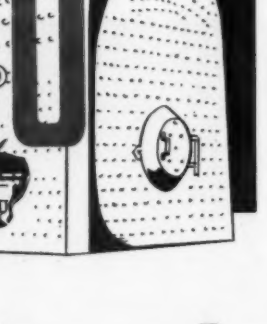

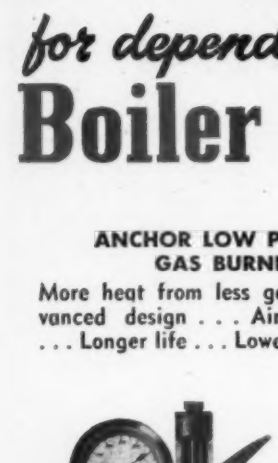

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phy, elevation 2,560 ft., are drilling by the bailer. The depth of the hole is 7,731 ft.

WEST VIRGINIA SUCCESSFUL WILDCAT

Wood County, Steele district: Columbian Carbon Co. 1-GW-1143 Godfrey L. Cabot, Inc. (J. A. Ruble Tract), elev. 908 ft., 13,179,000 cu. ft. of gas natural from Oriskany sand at 5,162-77 ft.. TD 5,177 ft.

WEST VIRGINIA WILDCAT FAILURE

Wirt County, Tucker district: Glen W. Roberts 1 Forrest Daugherty est., elev. 1,066 ft., dry, Corniferous lime 5,244 ft., Oriskany sand 5,383 ft., TD 5,389 ft.

Canadian Fields

New Gas Discoveries In Two Formations

CALGARY.—Natural-gas discoveries have been made in the Ellis sandstone and Madison limestone, with oil showings also recorded in the Madison, at the Turin wildcat on the south central Alberta plains. The discovery, located about 100 miles southeast of Calgary, is being drilled by the three-independent-company team of Anglo-Canadian Oil Co., Ltd.; Calmont Oils, Ltd.; and Calgary & Edmonton Corp., Ltd., each with one-third interest.

The discovery well, Anglo-Calmont-C. & E.-Turbin No. 1, LSD 6, 29-11-18-w4, ran three drill-stem tests, one in the Ellis sandstone which was topped at 3,679 ft. and two in the Madison which was topped at 3,684 ft. The well is currently drilling below 4,141 ft., heading for its Devonian objectives.

The Ellis drill-stem test, of interval 3,674-85 ft., gave an estimated natural gas flow rate between 7 and 8 million cubic feet daily. Pipe recovery during that 1-hour test was 90 ft. of salt water. First Madison test, of interval 3,683-90 ft., gave a gas flow estimated at 5 million cubic feet daily, plus a 1-hour pipe recovery of 210 ft. of muddy oil emulsion and 30 ft. of salt water. Second Madison test, from 3,690-97 ft., gave a gas flow of 133,000 cu. ft. daily. Recovery during that last 1-hour test was made up of 240 ft. of oil-water emulsion, 60 ft. of mud and 390 ft. of salt water.

Shell Oil Co. and British American Oil Co., Ltd., have made a natural-gas discovery in northwest Alberta, 4 miles west of the Whitelaw railway point. Four gas-yielding drill-stem tests have so far been made. A large total flow of gas from the 3,300-3,468-ft. level is indicated.

The discovery well is Shell and British American-Whitelaw No. 1, in LSD 2, 14-72-2w6. The gas has come in a formation midway down the scheduled completion depth. The well is intended as a deep test to around 6,500 ft. to the Devonian. Location is 36 miles northwest of Imperial's Normandville Devonian oil discovery, the strike some months ago that sparked the present big-scale exploration of northwest Alberta.

Official report on the Whitelaw drill-stem tests indicate the largest single gas flow through tester was in the interval 3,371-3,468 ft. Maximum gas flow rate on that test was 7,020,000 cu. ft. daily. Tester was open 30 minutes. There was no fluid recovery.

First test was of interval 2,858-87 ft., giving in 30 minutes a gas-flow rate of 70,000 cu. ft. daily, plus pipe recovery of 480 ft. of muddy salt water. Some 300 ft. deeper a better gas sand came in. Drill-stem test of interval 3,298-3,335 ft., a 90-minute run, brought gas flow rate of 775,000 cu. ft. daily in 50 minutes, with pipe recovery 480 ft. of gas-cut mud. Test of interval 3,338-64 ft., also 90 minutes, gave 66,000 cu. ft. of dry gas in 60 minutes, and pipe recovery of 90 ft. of slightly oil-cut mud.

UNSUCCESSFUL WILDCATS

Gulf-P. Mardell No. 9, LSD 9, 14-34-22w4, TD 7,040 ft.

Wilton Park No. 1, LSD 14, 19-50-27w4, TD 5,910 ft.

Permian Basin

New Kent County Field Gets Apparent Confirmation

MIDLAND.—Confirmation production from the Strawn lime was in sight for Clairemont field of Kent County as Sun Oil Co. 1 D. F. Sampson, NW NW 9-98-H&TC, an east offset to General Crude Oil Co. 1-A Percy Jones, recovered 5,150 ft. of clean oil on a 1-hour drill-stem test from 6,741-51 ft., 1 ft. off bottom. The drill pipe had unloaded seven times while coming out of the hole. There was no water. Operators ran electric surveys and set 7-in. casing to 6,744 ft. A previous test from 6,707-19 ft. recovered 60 ft. of oil-cut mud and 1 ft. of free oil. The Clairemont discovery, General Crude 1-A Percy Jones, completed from open hole pay at 6,742-52 ft.

In west central Kent County, Estill S. Heyser, Jr. 2 L. T. Lohman, 114-G-W&NW, was drilling below 6,316 ft., with no reef reported. Spartan Drilling Co. and others 1 Wallace estate, 97-G-W&NW, was drilling below 7,118 ft. in lime and shale, with lime streaks showing oil stains and odor.

In northwest Gaines County, Shell Oil Co. 1 Foster, NW NW 492-G-CCSD&RGNG, 11 miles southwest of Denver City and 1 mile northwest of Russell Clear Fork field, was drilling ahead at 11,167 ft. in lime after making a good show of oil in a formation tentatively identified as the Devonian. A drill-stem test from 11,054-11,110 ft., open 90 minutes, had gas in 19 minutes, mud in 53 minutes; then flowed to pits for 7 minutes. The next 30 minutes it flowed 40 bbl. of 40°-gravity oil cut 4 per cent with drilling mud. Gas-oil ratio was 95 cu. ft. Operators reverse-circulated out 112 bbl. of oil. Flowing bottom-hole pressure ranged from 650-3,812 psi.

Tide Water Associated Oil Co. 1-E-A Tapp, 2-C38-PSL, second well in Corrigan Silurian field of Terry County had 5½-in. casing set on bottom at 11,600 ft. and was waiting on cement. A drill-stem test from 11,514-11,600 ft., open 4 hours and 55 minutes, flowed the water blanket in 1 hour and 55 minutes, oil and mud in 2 hours and 55 minutes, then flowed to pits for 1½ hours to clean; following that it gaged 17.68 bbl. of oil in 30 minutes. The oil was 35° gravity, with no water. Bottom-hole flowing pressure was 4,350 psi., and shut-in pressure gaged 5,700 psi. Oil in the pipe was reversed out.

Vincent & Welch, Inc., Midland, 1 P. M. Davis, Runnels County Palo Pinto discovery 2 miles southeast of Winters, prepared to complete after setting 7-in. casing around 3,590 ft. The well showed gas to the surface in 5 minutes, and oil in 42 minutes, on a drill-stem test from 3,592-3,610 ft. For 3 hours and 18 minutes, oil flowed at an estimated rate of 10 bbl. an hour through ½-in. tubing choke, and when the testing tool was pulled, recovery was 1,200 ft. of clean 43°-gravity oil, with no water. Location of the 1 Davis is 1,320 ft. from south and 330 ft. from east lines of the H&TC Survey 329.

Seven miles southeast of Winters, O. W. Killam and others' 1 J. Pettus Knight, Section 346, BBB&C Survey, encountered a heavy gas when casing was perforated from 3,958-68 ft. in a Strawn sand. Estimates on gas volume ranged to 20,000,000 cu. ft. daily, which was flowing wild at last report. Location is about 2 miles east of Hatchell and 1½ miles west of the old McMillan field.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Hockley County: Honolulu Oil Corp. and Signal Oil & Gas Co. 1-13 M. D. Underwood, 510 ft. from N & E lines, Labor 13, League 5, Wilbarger CSL, in SE corner of county about 8 mi. N of S line and 4½ mi. W of W county line, Cisco reef discovery, TD 9,325 ft., elev. 3,389 ft., top reef 9,285 ft., pay 9,290 ft., flowed natural 2,236 bbl. of 42°-gravity oil a day, 1-in. choke, GOR 386 cu. ft., TP 710-120 psi., CP 750-225 psi.

Lynn County: Magnolia Petroleum Co. 1 Garza Land & Cattle Co., NW SE 431-9-ELRR, 3½ mi. SE Draw, TD 8,630 ft., elev. 2,920 ft., Canyon reef 8,615 ft., 7-in. casing 8,615 ft., flowed 245 bbl. of 42°-gravity oil a day, ⅜-in. choke, GOR 676 cu. ft., TP 130 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Borden County: Nelson Bunker Hunt 1 Mrs. Bella Clark, SW NE 3-31-4N-T&P, 2½ mi. S Gail, dry, TD 9,252 ft., elev. 2,521 ft., Sprayberry 5,570 ft., Pennsylvanian reef 8,020 ft., Mississippian 8,855 ft., Ellenburger 9,224 ft.

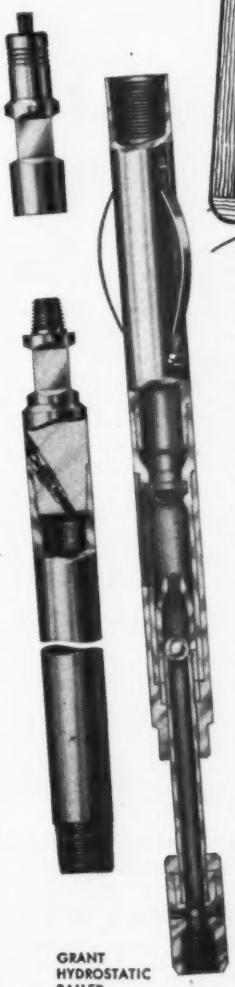
Garza County: Callihan & Harrison 1 W. G. Williams, 83-5-H&GN, SE corner of county, dry, TD 3,840 ft., elev. 2,317 ft. Ted Weiner and Sohio Petroleum Co. 1 S. M. Swenson & Sons, NE NE 17-2-H&GN, NE corner of county, dry, TD 7,931 ft., elev. 2,325 ft., Palo Pinto 6,261 ft., Cisco reef 6,362 ft., Mississippian 7,582 ft., Ellenburger 7,918 ft.

Kent County: Kewanee Oil Co. 1-B Wilson Connell, NW NW SE 3-5-H&GN, SW corner of county, dry, TD 2,355 ft., elev. 2,301 ft., bailed sulfur water 1,965 ft.

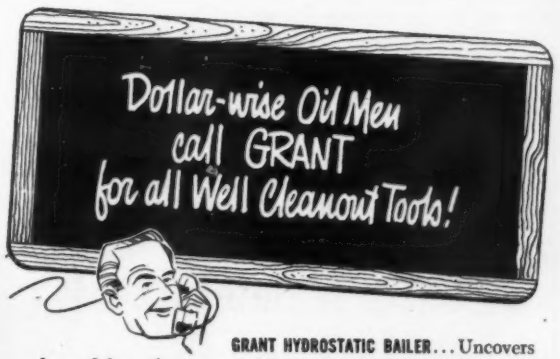
Kimble County: R. F. Schoolfield 1 A. D. Rust, BS&F Sur. 47, 20 mi. NW Junction, dry, TD 2,196 ft. in sand, elev. estimated 2,244 ft., Turkey Creek 2,188 ft.

Lynn County: W. E. Dunigan 1 G. F. Holland, NE NE NE 13-J-GWT&P, 8½ mi. NW Snowden 1 Williams, 5 mi. NW PHD field, dry, TD 4,107 ft., elev. 3,044 ft., anhydrite 1,490 ft., salt 1,570 ft., Yates 2,030 ft., San Andres 3,130 ft.

Reeves County: Gulf Oil Corp. and Jack Frost 1 Geo. Kinnear Estate, 23-50-T8-T&P, dry, TD 5,452 ft., elev. 2,793 ft., Delaware lime 5,132 ft., sand 5,162 ft. Hill & Hill 1 Brackenridge Estate, 39-57-



GRANT HYDROSTATIC BAILER



GRANT HYDROSTATIC BAILER... Uncovers large fish... cleans out tubing... breaks hard-packed sand bridges... removes rock, sand, plastic... and when used in conjunction with a Grant Junk Basket is an effective fishing tool.

GRANT HYDROSTATIC PERFORATION CLEANER... Loosens and completely removes from the well—sand, mud, paraffin, asphalt or other foreign material from perforated casing or screen pipe by the powerful suction created by the hydrostatic pressure in the well.

GRANT SAND PUMPS... For removing unconsolidated mud and sand from the well.

GRANT WIRE LINE DUMP BAILER... For spotting cement slurry, acid, oil, plastic or other liquid at any desired point in the hole accurately and easily. The entire load is discharged in a compact homogeneous mass. The operator has full control of the tool at all times.

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Reamers	Bulletin No. 43
Hydrostatic Perforation Cleaners	Bulletin No. 50
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PSL, 15 mi. N Toyah, dry, TD 3,977 ft., elev. 3,115 ft., Black lime 3,836 ft.

Runnels County: Delaware Drillers, Inc. 1 A. L. Mitchell, Sec. 96, E. L. Pearcy Sur., 6½ mi. NW Winters, 2 mi. NE North Winters field, dry, TD 5,150 ft., elev. estimated 1,948 ft., Saddle Creek 2,531 ft., Gunsight 2,911 ft., Ellenburger 5,043 ft., DST in Ellenburger had oil and gas-cut mud, and salt water.

John K. Dorrance Trustee 1 L. Mapes Estates, C. Montes Sur., SE corner of county, dry, TD 3,260 ft., Fry 3,122 ft., Ellenburger 3,652 ft.

Richard King, Jr. 1 T. R. Dorsett, T. J. Runnels Sur. 2, 5½ mi. N Winters, dry, TD 4,860 ft., elev. 1,963 ft., Gunsight 2,830 ft., Palo Pinto 3,877 ft., Capps 4,132 ft.

Spartan Drilling Co. 1 Levy Lee, 120-acre tract, B. Sandoval Sur., W-central part of county, dry, TD 5,323 ft., Home Creek 3,565 ft., Ellenburger 5,134 ft., DST in Ellenburger had slightly oil and gas-cut mud, sulfur water.

Warren Oil Corp. 1 W. P. Gardner, M. J. Parramore Sur. 98, 4½ mi. N Winters, dry, TD 5,062 ft., elev. 1,956 ft., Gunsight 2,789 ft., Palo Pinto 3,848 ft., upper Capps 4,107 ft., lower Fry 4,221 ft., Caddo 4,779 ft., Ellenburger 4,960 ft.

SOUTHEAST NEW MEXICO

HOBBS.—Apache Oil Co. 1 Noble, 18-4s-27e, 6 miles west of Olive in Chaves County, was drilling ahead below 6,460 ft. in limestone, shale, and chert. The well has been shut down at 6,392 ft. while making tests on a gas-bearing section in the lower Pennsylvanian. Top of the Mississippian was 6,350 ft.

Amerada Petroleum Corp. 1-R-A, SW SW 22-8s-32e, was drilling in lime at 6,195 ft. Top of the Clear Fork at 5,580 ft. was about 114 ft. high to Barnsdall Oil Co. 1 State in 23-8s-32e, it was said.

Honolulu Oil Corp. 3 State, NE SE 13-11s-27e, east offset to its recent discovery, was shut down for orders at 6,533 ft. following a 4-hour drill-stem test at 6,477-6,512 ft. The test produced a good blow of air throughout and recovered 300 ft. of 40°-gravity oil. A second test from 6,517-33 ft. recovered 400 ft. of oil. Top on the Devonian was 6,507 ft.

In NE NW 24-11s-27e, south of the Devonian discovery, Honolulu 1 Federal-Hinkle had total depth at 6,817 ft., in Devonian topped at 6,565 ft. Drill-stem tests were: From 6,580-6,612 ft., open 2 hours, recovered 5 ft. of drilling mud; from 6,700-41 ft., 3½ hours, recovered 900 ft. of salt water and 5,000 ft. of sulfur water; from 6,775-95 ft., open 2 hours, recovered 180 ft. of gas-cut drilling mud and 300 ft. of heavily oil and gas-cut salt water, and from 6,799-6,817 ft., open 4 hours, the recovery was 3,810 ft. of salt water.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Chaves County: Magnolia Petroleum Co. 1 Lightcap Land Co., SE SE 6-8s-30e, TD 7,978 ft., elev. 4,075 ft., Devonian 7,955 ft., 5½-in. casing 7,978 ft., perf. 64 shots 7,960-76 ft., IP flowed 492 bbl. 52°-grav. oil a day, ¼-in. choke, GOR 1,472 cu ft., CP 850 psi., TP 840 psi., completed natural.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Eddy County: Humble Oil & Refining Co. 1 O. A. Pearson (originally drilled as Mesa Retailers 1 Blindsnake), 2-16s-25e, old TD 5,065 ft., new TD 8,243 ft., dry, elev. 3,455 ft., Pennsylvanian 4,964 ft., Cisco 5,945 ft., Canyon 6,493 ft., Mississippian 6,815 ft., Hunton lime 7,404 ft., Montoya 7,565 ft., pre-Cambrian 8,195 ft., last DTS 7,750-7,900 ft. had all salt water.

How to Keep COST DOWN on Valve Maintenance

Cleaning one valve before overhaul won't amount to much in time or money, that's true! But multiply that one valve by thousands—at year's end your expenditure will be pretty high.

If your valve maintenance-cleaning runs into big money, we believe we can help you hold your costs way down. We believe (and many refiners will agree) that Oakite Steam-Detergent cleaning with the Oakite Solution-Discharging Steam Gun will prove infinitely superior to manual scrubbing . . . ON ALL COUNTS. It's quicker, more efficient and decidedly more economical.

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PETROLEUM SERVICE DIVISION

Eastern Texas

Drilling Program Set for Pewitt Ranch Field

DALLAS.—An eight-well drilling program for Pewitt Ranch Paluxy sand field of Titus County has been scheduled by A. O. Phillips and associates, to be divided between the Banks and Dundas surveys, east of Talco.

Locations in the Banks Survey were: No. 4-B Paul Pewitt, 2,310 ft. from south and 330 ft. from east lines of a 211-acre tract; 6-B Pewitt, 330 ft. from west and 2,700 ft. from north lines of tract; 8-B Pewitt, 330 ft. from west and 1,650 ft. from south lines of the tract, and 10-B Pewitt, 330 ft. from south and west lines of tract.

Locations in the Dundas Survey were: No. 1-E Pewitt, 330 ft. from north and west lines of a 160-acre tract; 2-E Pewitt, 983 ft. from west and 330 ft. from north line of tract; 1-F Pewitt, 330 ft. from north and east lines of a 252½-acre tract, and 3-A Pewitt, 330 ft. from west and 260 ft. from north lines of the tract.

Bobby Manziel 1 M. A. Davey, 6,000-ft. wildcat in the southeast corner of Anderson County, had surface pipe set and was drilling ahead. The new exploratory test is 16 miles east of Elkhart on a 664-acre tract in the Washington Lewis Survey. Drill site is 3,700 ft. west of east line and 8,200 ft. south of north line of the survey. Elevation was reported as 320 ft.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Denton County: Lee Hicks 1 W. H. Newton, R. M. Burleson Sur., A-65, 1½ mi. S Sanger, dry, TD 2,045 ft.

Rav Holbert 1 Dallas Cutsinger, J. B. Reed Sur., A-1086, ½ mi. S Bolivar, dry, TD 2,076 ft., sand 1,662-80, 1,169-75 ft., had salt water.

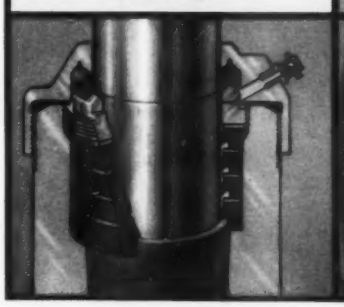
Falls County: L. G. Broiles 1 Ed Good, 100-acre tract, J. M. Graham Sur., 4 mi. NE Lott, dry, TD 1,385 ft., elev. 431 ft., Austin 769 ft., Buda 1,098 ft., by samples, no shows reported.

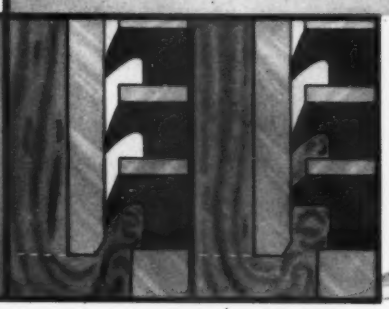
THE MOST Important Improvement IN SWIVEL DESIGN IN YEARS!

The washpipe and packing assembly always has been one of the most troublesome parts of a swivel. Complicated design, improper lubrication and extremely short service life have caused untold hours of rig down time. Emsco swivels incorporate a new cartridge washpipe packing. This exclusive Emsco feature eliminates all lubrication, installation and servicing problems. It is a one-piece assembly consisting of four lip-type seal rings, separated and supported by steel thrust spacers. The outer portion of each ring is made of heavy material. The steel thrust spacers take all of the fluid pressure load. All pressure imposed by the packing clamping nut is absorbed by the solid outer portion of the cartridge. The soft, flexible sealing lips are never deformed. Lubrication is positive. Friction reduced. Life of both packing and washpipe increased.

THE EMSCO CARTRIDGE WASHPIPE PACKING*

EASIER INSTALLATION
Cartridge washpipe packing can't be installed incorrectly. There is only one piece. It fits only one way. After long, severe service, packing can be easily renewed in a fraction of the time required for conventional style packings.





POSITIVE LUBRICATION—The soft, flexible sealing lips permit free passage of grease. Grease goes where it belongs. Lubrication is positive. The need for a wear bushing to protect sleeve is eliminated. Reduced friction increases life of washpipe and packing.

LONGER LIFE—Emsco cartridge washpipe packing has a unique "step-wear" action. When packing is new, lowest ring performs all sealing action. The mud presses lip firmly against washpipe. The higher the pressure, the more perfect the seal. Only outer extremity of sealing lip is subject to wear. As lip wears, next ring takes up sealing function. As this lip wears, it in turn passes sealing function to next lip. This "step-wear" action reduces friction between washpipe and packing and assures long, trouble-free service life.

*Patent Pending.

Cartridge washpipe packing is just one of many outstanding features found in Emsco swivels. Ask your nearest Continental-Emsco representative for complete information. There is a size and type to meet all drilling requirements.

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SAVE WIRE LINE!

EMSCO "M" SERIES BLOCKS INCREASE WIRE LINE TON-MILE LIFE 40% OR MORE!

Actual case histories show that EMSCO M-Series Crown and Traveling Blocks increase ton-mile life of wire line by 40% or more. Many operators report that savings resulting from increased wire line life more than pay for the cost of the blocks. This increased wire line life results from patented design features found only in EMSCO blocks.

EMSCO M-Series Blocks are engineered to meet the specialized problems of deep drilling. They are extremely narrow and compact. They do not restrict pipe racking space. Their short length permits full height of derrick to be utilized. Large diameter straight roller bearings with built-in thrust shoulders provide maximum load capacity with minimum block width. All EMSCO traveling blocks are streamlined and completely guarded. There are no projections which might cause blocks to hang up. Sheave guards easily removed for reeving wire line.

Your nearest EMSCO representative will be happy to show you how EMSCO M-Series Blocks increase life of wire line. These amazing savings are yours *only* with EMSCO crown and traveling blocks.

CLOSE TO GROOVE

Close proximity of bearing to sheave groove prevents tilting of block . . . minimizes wear on wire line . . . adds pyramidal stability to sheaves. Minimized tilting of empty block decreases lateral chaffing of wire line.

FLAME-HARDENED GROOVES

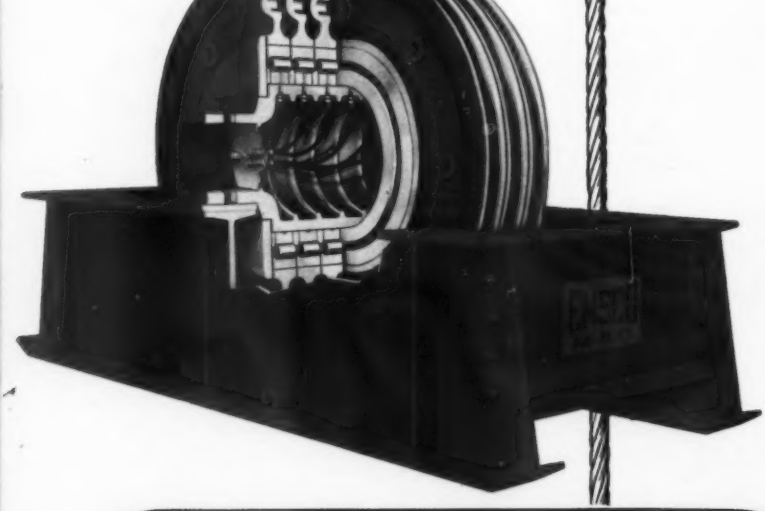
Flame-hardened grooves maintain ideal sheave groove contour, minimizing wire line wear. Side contact between adjacent sheaves is eliminated. Balanced sheaves assure smoother operation and longer life. Close spacing of sheaves reduces width of block . . . keeps lines parallel.

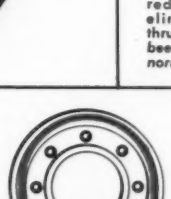
LARGE DIAMETER BEARINGS

Large diameter roller bearings assure freely rotating sheaves and fast-dropping empty blocks. Built-in thrust shoulders reduce width of block and eliminate use of hazardous thrust washers. *There has never been a bearing failure due to normal wear.*

NOW AVAILABLE IN 42," 50" and 60" SHEAVE MODELS

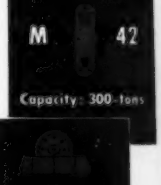
All of the field-proven features of the Emsco M-50 Crown and Traveling Blocks are now available in both 42-inch and 60-inch sheave models to meet all requirements of deep to deepest drilling. Other Emsco blocks available to meet any drilling requirement.

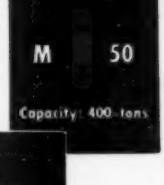


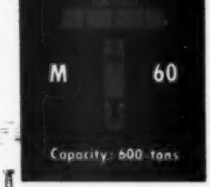


LARGE DIAMETER SHEAVES

Large diameter alloy steel sheaves reduce bending stresses in wire line. Sheaves and bearings are interchangeable between mating blocks. Lines are parallel and run true in sheave grooves. This minimizes lateral chaffing of line.







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Kansas

Swabbing Tests Produce In Nebraska Wildcat

PRODUCTION along the Central Kansas Uplift appears to have been extended further northward into southern Nebraska at Alpine Oil & Royalty Co. and B. & R. Drilling Co. 1 Fischer, SW SW SE 33-1n-18w, southern Harlan County, which swabbed 3½ bbl. of oil per hour while testing the Lansing-Kansas City pay zone. Lansing, topped at 3,228 ft. (—1,201 ft.), is open through casing perforations at 3,402-06 ft. Pay zone was given a 2,000-gal. acid treatment. Total depth is 3,450 ft. with 5-in. casing on bottom.

The discovery, located about ½ mile north of the Phillips County, Kansas, line, is about 5½ miles to the north of the Huffstetter pool, currently the most northerly pool along the Central Kansas Uplift, which extends in a northwesterly-southeasterly direction through central and western Kansas. It has precipitated an active lease and royalty play extending further northward in South Central Nebraska. Drilling already is under way at another Harlan County wildcat, Powell & Peters Drilling Co. 1 Kauk, NW NW NW 17-1n-18w, 5 miles northwest of the Alpine discovery.

Another producing area is being opened in northwestern Stafford County, Kansas, where Petroleum, Inc. 1 Russell, SW SE NW 25-21-14, swabbed at the rate of 10 bbl. of oil per hour in testing Lansing-Kansas City lime, topped at 3,396 ft. (—1,472 ft.). Pay zone is producing through casing perforations at 3,575-82 ft.

Willis L. Hartman 1 Martin-Webster, NE NE NE 9-10-21, which opens another in a succession of new pools which have been established in the Morel area of southeastern Graham County within recent months, swabbed 110 bbl. of oil in the first 12 hours while testing Lansing-Kansas City lime. Casing was perforated at 3,696-3,704 ft. Top of the formation is 3,502 ft. (—1,242 ft.). After perforating, oil rose 1,500 ft. in the hole overnight. Hole had been drilled to the Arbuckle, logged at 3,834-40 ft. The latter horizon failed to produce and hole was plugged back to 3,750 ft.

Confirmation of the recent discovery of the Boyle pool, Barton County, is being given at Yellow Cab Co. 1 Dirreen, NE NW NE 20-17-14, south offset to the discovery well. Testing Arbuckle lime at 3,406-08 ft. (—1,497-99 ft.), the confirming well swabbed 31 bbl. of oil in the first 5 hours, and is being put on the pump

KANSAS SUCCESSFUL WILDCATS

Barton County: Herndon 1 Eveleigh, SE SE NW 9-18s-13w, pumped 10 bbl. of oil per day from Lansing at 3,078-3,162 ft., TD 3,316 ft., elev. 1,814 ft.

Hodgeman County: "Jetmore Townsite—Shell 1 Springer, SE SW SW 24-22s-24w, elev. 2,383 ft., IP 1,385 bbl. of 37.8°-gravity oil per day from Mississippi lime at 4,580-4,642 ft., TD 5,148 ft.

Rooks County: Nadel & Gussman 1 Kern, NW NW SW 28-9s-20w, (3,000-bbl. potential) TD 3,859 ft., elev. 2,277 ft.

Wabaunsee County, E. Davis Ranch area: Aladdin 1 Shutter, SW SW SW 34-13s-10e, pumped 21 bbl. of oil per day from Viola topped at 3,305 ft., TD 3,314 ft., elev. 1,398 ft.

KANSAS WILDCAT FAILURES

Barton County, Beaver area: Derby 1 Staudinger, NE NE NE 18-16s-12w, elev. 1,863 ft., Dry, TD 3,416 ft., Sooy 3,331 ft., Arbuckle 3,396 ft.

Aladdin et al., 1 Spainer, SW NW SE 16-19s-12w, elev. 1,878 ft., dry, TD 3,498 ft., Topeka 2,725 ft., Lansing-Kansas City 3,187 ft., cherty Sooy 3,444 ft., Arbuckle 3,448 ft.

Chase County: Mendenhall 1 Piper, SE NE NE 15-20s-9e, elev. 1,356 ft., dry, TD 2,499 ft., Lansing 1,453 ft., Kansas City 1,551 ft., Marmaton 1,880 ft., Cherokee 2,115 ft., Bartlesville 2,307 ft., Mississippi lime 2,454 ft.

Ellis County, Ruder area: Armer 1 Ruder, NE NE SE 5-15s-18w, elev. 2,030 ft., dry. TD 3,660 ft., Topeka 2,867 ft., Heebner 3,269 ft., Lansing-Kansas City 3,319 ft., Sooy 3,605 ft.

Ellsworth County: Borell 1 Mattas, NW SW SW 36-14s-10w, elev. 1,621 ft., dry, TD 3,137 ft., cherty Sooy 3,063 ft., Arbuckle 3,100 ft.

TD 3,865 ft., Mississippi lime 3,802 ft.

Lyon County: Susmio 1 Warren, SE SE SW 19-20s-10e, elev. 1,335 ft., dry, TD 2,303 ft.

Morris County, Alta Vista gas area: Carter 1 Jacobs, NW NW SE 10-14s-8e, dry, TD 2,451 ft., Hunton 2,003 ft., Maquoketa 2,128 ft., Viola 2,212 ft., asphaltic residue 2,300 ft., Simpson sand 2,308 ft., Arbuckle 2,403 ft.

Rooks County, S. Zurich Twst.; Hartman 1 Smee, NE NE NE 35-9s-19w, elev. 2,200 ft., dry, TD 3,752 ft., Topeka 3,160 ft., Heebner 3,362 ft., Toronto 3,386 ft., Lansing-Kansas City 3,406 ft., Sooy 3,640 ft., erosional Arbuckle 3,707 ft., Arbuckle 3,735 ft.

Berland area: Lewis 1 Vohs, SE SE NW 24-10s-19w, elev. 2,073 ft., dry, TD 3,650 ft., Sooy 3,583 ft., reworked Arbuckle 3,597 ft., Arbuckle 3,610 ft.

Russell County, NW Dillner area: Stearns

Graham County: Nadel & Gussman 1 Newell, SE SE SE 30-8s-21w, elev. 2,202 ft., dry, TD 3,752 ft.

Sunray 1 Smith, NW NW SW 30-9s-21w, elev. 2,336 ft., dry, TD 3,952 ft., basal Kansas City 3,788 ft., Sooy 3,872 ft., Arbuckle 3,922 ft.

Skelly 1 Eichman, SE NE NE 32-9s-21w, elev. 2,325 ft., dry, TD 3,965 ft., Topeka 3,338 ft., Heebner 3,522 ft., Toronto 3,543 ft., Lansing-Kansas City 3,564 ft., Sooy 3,848 ft., Arbuckle 3,932 ft.

Kingman County: Page et al., 1 Lindholm,

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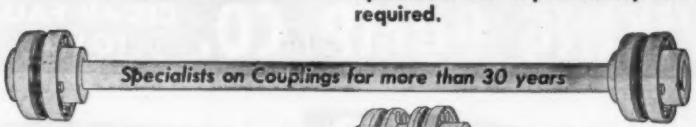

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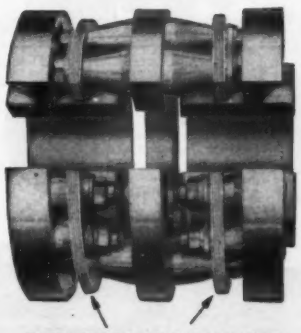

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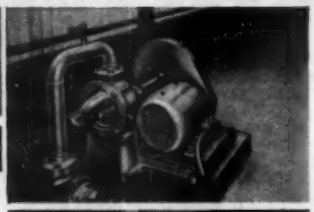

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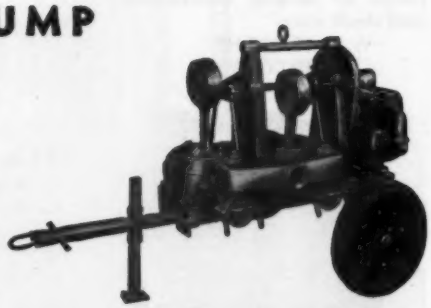

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SW NE NE 22-28s-5w, elev. 1,383 ft., dry, 1 Cook, SW NW NW 23-13s-15w, elev. 1,873 ft., dry, TD 3,321 ft.

Anderson-Prichard 1 Collins, NE SE SW 16-12s-15w, elev. 1,799 ft., dry, TD 3,310 ft., Heebner 2,902 ft., Lansing-Kansas City 2,961 ft., Arbuckle 3,288 ft.

Stafford County, Drach area: Palmer 1 Alpers, SE SE NW 5-22s-12w, elev. 1,870 ft., dry, TD 3,700 ft., Lansing-Kansas City 3,340 ft., Sooy 3,581 ft.

Sumner County: Wakefield 1 Harris, SW NE SW 3-32s-1e, elev. 1,287 ft., dry, TD 4,080 ft., Simpson 4,041 ft.

Wellington area: Justice 1 Stephenson, NW NW SW 9-32s-1w, elev. 1,206 ft., dry, TD 3,715 ft.

Wabaunsee County: Wenzel et al., 1 McComb, SE SW NW 6-13s-10e, dry, TD 3,307 ft., Hunton 2,824 ft., Maquoketa 3,075 ft., Viola 3,148 ft., Simpson dolomite 3,250 ft., Simpson sand 3,263 ft., Arbuckle 3,293 ft.

Oklahoma

Lincoln County Wildcat Completed as Producer

J. R. McLEAN is completing his 1 North, SW SE NW 9-13n-5e, 3 miles east of Sparks, southeastern Lincoln County, as the discovery well of a new Prue sand pool. Turned into the separator, the well flowed 63 bbl. of 40.2°-gravity oil in the first 6 hours with gas gaged at the rate of 2,000,000 cu. ft. per day. First hour's oil production was 11.2 bbl. through ½-in. choke. For the remaining 5 hours, production was through ¾-in. choke. Flowing pressure on the tubing was 300 psi. The sand, topped at 3,505 ft., is open at 3,508-24 ft. Nearest other production is in the South Davenport pool, 4 miles to the north.

Wilcox Oil Co. 1 Dugger, C NW SE 12-10n-22w, deep wildcat test north of the Doxey townsite, Beckham County, flowed at the rate of 4 to 5 bbl. of 44°-gravity oil per hour for a time during a drill-stem test at 10,980-11,063 ft. in the Pennsylvanian conglomerate section in which it has encountered showings at various other levels. Water flow with the oil gaged 10 bbl. per hour at first but gradually increased and drowned out the oil. Gas flow was estimated at 500,000 cu. ft. per day. Testing tool was open 9 hours. At latest report another drill-stem test was to be run taking in a narrower interval.

A possible link in connecting the narrow, elongated South Ceres and small Northeast Longview pools, Noble County, has been indicated at Howell & Howell and Walter Duncan 1 Jirious, SW SW SW 31-24n-1e, which found good saturation in Burbank sand at 4,302-68 ft.

Gulf Oil Corp. has what appears to be an exceptionally good producer on the east side of the Rosenwald pool, northwestern Okfuskee County. Its 1 Droppleman, SE NW NE 23-13n-8e, swabbed and flowed at the rate of more than 40 bbl. of oil per hour while testing with hole open both in the Union Valley and Cromwell sands. Total depth is 3,452 ft. with 7-in. casing at 3,439 ft. Union Valley was topped at 3,437 ft., and the Cromwell at 3,443 ft.

Recent opening of Hunton lime production in the Northeast Shawnee pool, Pottawatomie County, is being confirmed at Atlantic Refining Co.'s second test to this pay zone. The confirmation well, Whistler, C SW SE 18-11n-5e, was swabbed in and flowed at the rate of 35 bbl. of oil per hour for 4 hours through ¾-in. choke. The Hunton has casing perforated opposite an interval at 4,663-78 ft. Casing has been run through the section to 4,866 ft. with bottom of the hole at 4,869 ft. Main production of the pool is from Wilcox sand.

OKLAHOMA SUCCESSFUL WILDCATS

Cleveland County: Brown, Bulla & Bynum 1 Seiter, NW NW SW 29-10n-2w, 1½ mi. S Moore-Harp, elev. 1,168 ft., flowed

180 bbl. of 48°-53°-gravity oil per day through 12/64-in. tubing choke from second Wilcox topped at 7,342 ft., TD 7,408 ft.; LeCompton 3,704 ft., Lovell lime 4,476 ft., base Layton lime 5,719 ft., first oolitic 5,852 ft., Oswego 6,558 ft., Chimney Hill 6,838 ft., Sylvan 6,892 ft., Viola 6,993 ft.

Creek County, E. Cushing area: Casey & Daugherty 1 Oller, NE NE SW 17-19n-8e, flowed 216 bbl. of 39°-gravity oil per day from Red Fork at 2,540-55 ft., TD; Hogshooter 1,358 ft., Checkerboard 1,680 ft., Big lime 2,136 ft., Oswego 2,182 ft., Prue 2,278 ft., Verdigris 2,306 ft., Skinner 2,430 ft., lime 2,496 ft.

Garvin County, SE Maysville area: Frank Buttram 1 McDaniel, NE SW SW 27-4n-2w, elev. 1,054 ft., flowed 125 bbl. of 40°-gravity oil per day through ¼-in. choke from first Bromide sand at 6,351-6,444 ft., TD 6,448 ft., Tonkawa 4,457 ft., Dewey 5,038 ft., Hogshooter 5,412 ft., Abernathy 5,681 ft., Pharaoh 5,785 ft., basal Pennsylvanian-Viola 5,921 ft., Bromide dense 6,180 ft.

Lincoln County: Creekmore - Rooney 1 James, NE NE SE 32-14n-6e, 1½ mi. E Peck, flowed 64 bbl. of 43°-gravity oil per day from Prue at 3,073-3,113 ft., TD; Hogshooter 1,813 ft., Layton 1,923 ft., Checkerboard 2,193 ft., Cleveland 2,202 ft., Oswego 3,016 ft.

OKLAHOMA WILDCAT FAILURES

Bryan County, Aylesworth area: Miller Bros. 1 Chrisman, SW SW SW 28-6s-7e, dry, TD 1,201 ft., lower Bilbo sand 745 ft.

Comanche County: E. K. McLennan 1 Tackett, NW NW NW 31-1n-9w, dry, TD 3,078 ft., sand lime 2,430 ft., sand 2,454 ft. and 2,596 ft., detrital Arbuckle 2,763 ft., Arbuckle 2,900 ft.

Lawton district: Sid Biles 1 fee, SE NW NE 20-2n-11w, dry, TD 480 ft., sand 277 ft. with slight show of gas.

Cotton County: Frank Wood 1 Patterson et al., W/2 E/2 NE 22-5s-12w, dry, TD 2,005 ft., fusilinid 1,612 ft., Megargel 1,756 ft., sand 1,818 ft., broken sand 1,944 ft.

Gray & Metcalf 1 Wright, SE SW NW 17-3s-12w, dry, TD 2,154 ft., sand 1,030 ft., granite wash 1,322 ft.

Creek County, W. Depew area: W. A. Delaney, Jr., 1 Owens, SW NE NE 4-15n-7e, elev. 930 ft., dry, TD 4,053 ft., upper Hogshooter 1,575 ft., upper Layton 1,625 ft., lower Hogshooter 1,660 ft., Layton 1,730 ft., Checkerboard 1,955 ft., conglomerate 1,993 ft., Big lime 2,725 ft., Peru 2,750 ft., Oswego 2,815 ft., Prue 2,832 ft., Verdigris 2,902 ft., Skinner 2,915 ft., lime 3,030 ft., Red Fork 3,080 ft., Inola 3,195 ft., Bartlesville 3,210 ft., lime 3,335 ft., Sylvan 3,914 ft., Viola 3,968 ft., dolomite 4,002 ft., second Wilcox 4,028 ft.

Garvin County: Kewanee Oil Co. 1 Blanton, SE NE SW 11-3n-1w, dry, TD 4,749 ft., Belle City 3,390 ft., Hogshooter 3,833 ft., Checkerboard 3,953 ft., basal Pennsylvanian-Bromide sand 4,128 ft., basal Pennsylvanian-McLish lime 4,185 ft., sand 4,150 ft., 4,175 ft., and 4,206 ft., dolomite 4,248 ft., sand 4,265 ft., 4,413 ft., and 4,443 ft., basal McLish sand 4,670 ft., Oil Creek lime 4,710 ft.

Greer County: An-Son Petroleum Corp. 1 Vaughn, SE NE NW 14-6n-21w, dry, TD 645 ft., very fine granite wash 567 ft., sandy granite wash 622 ft. with show of oil.

Jefferson County: Gilbreath & Ray 1 Thomas, NW SW NW 33-4s-6w, dry, TD 2,240 ft. in sand and shale, no log.

Lincoln County, Avery area: Kemp & Blackwell 1 Sanders, SW SW SW 21-17n-6e, elev. 919 ft., dry, TD 3,302 ft., Hogshooter 1,920 ft., Checkerboard 2,225 ft., Big lime 2,760 ft., Oswego 2,762 ft., Prue 2,904 ft., Verdigris 2,960 ft., no Skinner, lime 3,126 ft., Red Fork 3,170 ft., Inola 3,253 ft., Bartlesville 3,266 ft.

Logan County: Ashland 1 Adams, SW SW NW 29-17n-4w, 1⅞ mi. W Crescent, elev. 1,066 ft., dry, TD 7,083 ft., Pawhuska 2,854 ft., LeCompton 3,248 ft., Tonkawa 4,350 ft., Avant 4,575 ft., Layton 5,108 ft., upper Checkerboard 5,373 ft., lower Checkerboard 5,468 ft., Oswego 5,780 ft., Prue 5,890 ft., Verdigris 5,990 ft., unconformity 6,104 ft., Mississippi lime 6,148 ft., Woodford 6,454 ft., Misener 6,508 ft., Chimney Hill 6,580 ft., Sylvan 6,676 ft., Viola 6,774 ft., dense 6,824 ft., dolomite 6,878 ft., Wilcox 6,908 ft., Marshall 6,944 ft., second Wilcox 7,056 ft.

Okfuskee County, Rosenwald area: Konawa and W. H. Foster 1 Replogle, NW NW SW 24-13n-8e, est. elev. 799 ft., dry, TD 3,494 ft., Checkerboard Morrow 1,115 ft., Checkerboard lime 1,145 ft., Big lime 2,120 ft., Oswego 2,155 ft., Prue 2,189 ft., coal 2,281 ft., Senora sand 2,370 ft., upper Earlsboro 2,650 ft., lower Earlsboro 2,720 ft., Gilcrease 3,392 ft., second Gilcrease 3,410 ft., third Gilcrease 3,439 ft., Union Valley 3,452 ft., Cromwell 3,454 ft., Pitkin 3,468 ft., Caney 3,480 ft.

Osage County: Portable Drilling Co. 1 Osage Tract 190, NW NW NW 32-29n-8e, 3 mi. N Dog Creek, elev. 1,065 ft., dry, TD 1,950 ft., Wayside sand 1,894 ft.

Seminole County, Cromwell area: Portable Drilling Co. 1 Key, SE SW SE 21-10n-8e, dry, TD 3,708 ft., lime 3,100 ft., Booch 3,237 ft., Gilcrease 3,370 ft., Union Valley 3,578 ft., Cromwell 3,604 ft., second Cromwell 3,631 ft., Caney 3,658 ft.

NW Sylvian area: A. C. Allyn et al., 1 Kiker, NW NW SE 3-10n-7e, elev. 931 ft., dry, TD 4,517 ft., Checkerboard 1,442 ft., Cleveland 1,455 ft., Wewoka lime 1,652 ft., upper Wewoka sand 1,660 ft., lower Wewoka sand 1,980 ft., upper Calvin 2,225 ft., lower Calvin 2,435 ft., Senora sand 2,635 ft., Senora lime 2,742 ft., Allen sand 2,758 ft., lower Red Fork 3,035 ft., Inola lime 3,195 ft., Bartlesville 3,242 ft., Booch 3,491 ft., Gilcrease 3,525 ft., Union Valley 3,650 ft., Cromwell 3,664 ft., Pitkin 3,790 ft., Mayes 4,050 ft., Misener 4,182 ft., Woodford 4,156 ft., Hunton 4,188 ft., Sylvan 4,310 ft., Viola 4,400 ft., first Wilcox 4,460 ft., second Wilcox 4,501 ft.

Stephens County: Strother Bros. 2 State, SE SE NE 16-3s-8w, elev. 1,061 ft., dry, TD 7,261 ft., Canyon 4,560 ft., Viola 5,250 ft., Simpson 6,043 ft., Arbuckle 7,149 ft.

Tillman County: S. D. Johnson 1 Kinder, NW NW NW 7-2s-15w, elev. 1,127 ft., dry, TD 2,594 ft., sand 1,710 ft. with slight show of oil, granite wash 2,540 ft.

Illinois-Ind.-Ky.

Richland County, Illinois Gets Outstanding Well

IN the area between Olney and Calhoun in Richland County, Illinois, Calvert Drilling Co. has an outstanding McClosky well at 1 C. L. Jordan, NW NE NE 25-3n-10e. On a drill-stem test of the McClosky the well had gas in 2 minutes and flowed clean oil in 5 minutes. Bottom-hole pressure was 1,360 psi. Production is from pay

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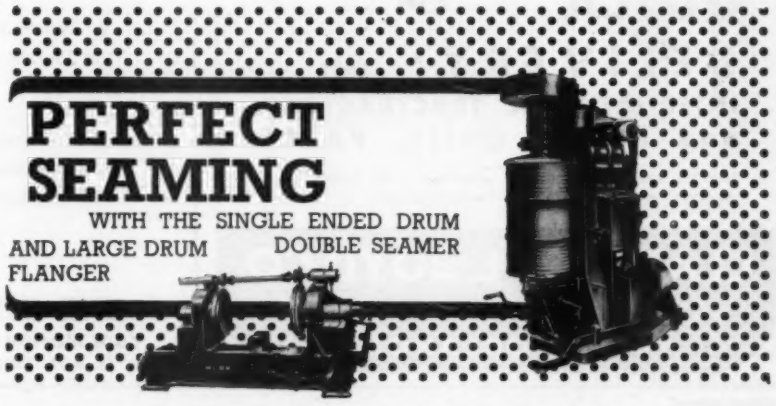

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at 3,184-88 ft. and 3,198-3,209 ft. with the hole bottomed at 3,210 ft. When the plug was drilled, the well flowed at the rate of 56 bbl. per hour and made 1,336 bbl. in the first 24 hours. The new well is a little less than 4 miles southeast of Olney and about 1 mile north of Calhoun.

Watkins Drilling Co. 1 H. Redd, SE NE SE 26-1s-6e, Wayne County, Illinois, had a good oil recovery on a drill-stem test of the McClosky at 3,226-35 ft. On the test, the well had gas in 8 minutes and a recovery of 2,520 ft. of clean oil at the end of the 1-hour test. Casing has been set at 3,224 ft. This well is just east of the Sims portion of Johnsonville Consolidated pool.

The Edwards County wildcat, A. J. Slagter 1 J. A. Kunust, SW NE SW 20-1n-10e, southeast of production in Bennington pool, is making about 150 bbl. per day from the O'Hara at 3,233-39 ft. No water is reported.

In the northeast corner of Knox County, Indiana, B.L.S. Drilling Co. 1 Schloot Heirs, NW SE SW 2-5n-7w, has set casing at 878 ft. for a test of 9 ft. of McClosky pay. Further to the southwest in the same county, Aurora Gasoline Co. 1 Clark Wells, 330 ft. from south line and 980 ft. from west line, Mil Don 165-2n-9w, is going on pump to test the Aux Vases at 1,536-46 ft. and 1,547-49 ft. after swabbing 3½ bbl. of oil per hour.

ILLINOIS SUCCESSFUL WILDCAT

White County: Dedman & Henderson 1 Dunn, NE NE NW 29-5s-8e, IP 175 bbl., Aux Vases 3,280-85 ft., TD 3,296 ft.

ILLINOIS WILDCAT FAILURES

Clay County: George & Wrather 1 McGrew, NW NW SE 15-2n-6e, dry, TD 3,175 ft.
Edgar County: J. L. Crawford 1 Frances, SW SW SW 26-14n-13w, dry, TD 487 ft.
Edwards County: J. W. Rudy 1 Hopper, SW SW NW 2-1n-10e, dry, TD 3,225 ft.
Effingham County: Kruger & Pogel 1 Grubb, SW SE NE 20-8n-4e, dry, TD 1,743 ft.
Jefferson County: C. E. Skiles 1 H. O. Thurness, SE SE NE 17-1s-1e, dry, TD 2,388 ft.
Skiles and Schlafly 1 Carr, NE NE NE 12-3s-2e, dry, TD 2,804 ft.
Lawrence County: A. Valtus 1 Richey, SW SW NW 6-3n-13w, dry, TD 2,912 ft.
Marion County: W. O. Shock 1 Haney, SE SE SE 23-1n-3e, dry, TD 2,917 ft.
Shelby County: Spickler & Hurst 1 Lading, NE NW NE 27-11n-5e, dry, TD 2,200 ft.
White County: J. L. Crawford 1 B. Lewis, NW SW NE 9-7s-9e, dry, TD 3,013 ft.

INDIANA WILDCAT FAILURES

Daviess County: F. R. Stocker 1 S. K. Hayes, NE NW SE 35-4n-7w, dry, TD 1,485 ft.
Dome and Minnick 1 D. Ogden, NW NE SW 1-5n-5w, dry, TD 886 ft.
Knox County: B.L.S. Drilling Co. 1 Clod-

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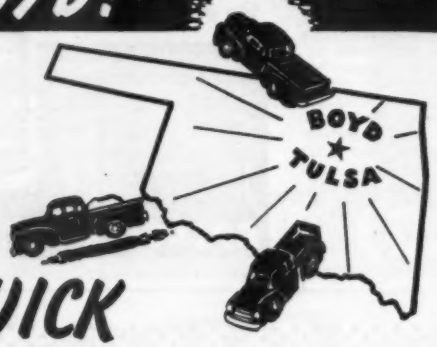

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felder, SE NE SW 2-5n-7w, dry, TD 889 ft.

Pike County: C. E. Skiles et al., 1 L. Shivers, NW SE SE 22-1n-7w, dry, TD 1,300 ft. Ryan & Sharp 1 Enos Coal, NE NE NE 18-3s-7w, dry, TD 3,207 ft.

Vigo County: T. & H. Corp. 1 Lora Welch, NW SE SW 35-11n-10w, dry, TD 2,210 ft. Plymouth Oil Co. 1 Ragie, NE NW NW 28-13n-9w, dry, TD 1,929 ft.

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: Miller & Shiarella and Ashland Oil & Refining Co. 1 St. Lawrence Church, S SW SE 18-P-32, dry, TD 1,340 ft.

Henderson County: Barron Kidd 1 E. Fellows, NW SE SW 25-P-23, dry, TD 2,768 ft.

EASTERN KENTUCKY

ASHLAND.—In Carter County, 13-W-78, A. H. Carpenter 1 J. W. Whitt is drilling at 3,368 ft. and nearing the St. Peter sand objective.

In Breathitt County, 1-M-77 United Carbon Co.'s prospective pool opener is still pumping at the rate of 150 bbl. per day from Mississippian lime at 1,165 to 1,300 ft. with hole bottomed at 1,377 ft. in red rock.

In Madison County, 11-P-61, the wildcat test of Cooly Ellis et al is still shut down for orders at total depth of 2,445 ft.

Rocky Mountain

Sussex-Meadow Creek Leads in Activity

DENVER.—Drilling in the Sussex-Meadow Creek area of Johnson County continues to lead both development and wildcat activity in the Rocky Mountains. There are now 18 rigs running in the 4 pools with 3 of these on wildcats east and south of the fields. During the past week Continental Oil Co. completed its second well in the Meadow Creek area as a northeast offset to the discovery. It flowed an average of 14 bbl. of oil per hour through ¼-in. choke from the Lakota sand between 7,472-94 ft. Three and a half miles south of this well, Macauley & Dorough of Denver have spudded a Lakota test on acreage farmed out from Sinclair Oil & Gas Co., and 3 miles southeast, Pioneer Drilling Co. and Brinkerhoff Drilling Co. are drilling on a Frontier sand test. In the East Sussex area, Bill Tomberlin (Casper independent) is drilling below 3,500 ft. on a wildcat in SW SW SW 19-42n-77w, the first of a series of three to test Frontier, and possibly lower zones.

The Trigood Oil Co.'s Muddy sand well in the Glenrock area, at 1 C & NW Railroad, SE NE NW 5-33n-75w, Converse County, Wyoming, is now reported flowing 75 bbl. of oil daily. Casing was run to the top of the zone at 7,035 ft. with total depth at 7,120 ft. This is the second Muddy producer in the field, and is a ½-mile southwest extension from the Steelco Drilling Co. discovery. Four other wells in the area have failed to find production in the same horizon.

The Ohio Oil Co. plans a wildcat in the Grant area, Perkins County, Nebraska. The well will be 1 State, C NW SW 16-10n-39w, and will test the Dakota. This is Ohio's first well away from its three Cheyenne County pools since discovery of oil at Gurley a year ago. However, Ohio has extensive lease holdings through Cheyenne, Garden, Deuel, Perkins, and Chase counties, and has reportedly done considerable seismic work in other areas. Two new wildcats are now under way in the western Nebraska play: B. B. Carter Drilling Co. is drilling below 3,000 ft. at 1 Klinge, SE SE NE 27-17n-49w (Dalton area) Cheyenne County; Jack Manning et al., are rigging up rotary at the Northeast Gurley wildcat at 1 Davis, NE NE SE 23-16n-49w.

Equity Oil Co. has spudded the first Entrada test in Ashley Valley field, Uintah County, Utah. Shows have been logged in Entrada in the field and the present location, in the C NW SW 23-5s-22e, is high structurally and may establish a small producing area in that zone.

Ohio Fields

North End of Clayton Pool Gets a Good Producer

COLUMBUS.—The Mid East Oil Co. 9 R. E. Beard, Section 32, Madison Township, Perry County, added another producer to the north part of Clayton field. The Clinton sand at 3,210-53 ft. made 20 bbl., natural, and 155 bbl. in 24 hours after a 130-qt. shot. In Harrison Township, R. B. Weed et al., 2 Browning, Section 32, logged the Clinton at 3,494-3,524 ft. with 660,000 cu. ft. of gas and only a small show of oil. The shot will probably bring in more oil. In Section 9 of the same township, B. G. Davis 1 M. Stalder, gaged 215,000 cu. ft. of gas, natural, and 480,000 cu. ft. when shut-in 4 hours after shot. The Clinton was found at 3,444-94 ft.

Shuff & Bucy 1 Ora and Otis Johnson, Section 14, Jackson Township, Knox County, gaged 675,000 cu. ft. of gas and a show of oil, natural. The Clinton sand at 2,909-49 ft. has not been shot yet and the gas was turned into the line. The well is ¼ mile south of the main east and west trend of Bladensburg oil pool.

Frank Lyons has staked a location for a wildcat on L. C. Miller property on Lot 2, Macedonia Township, Summit County.

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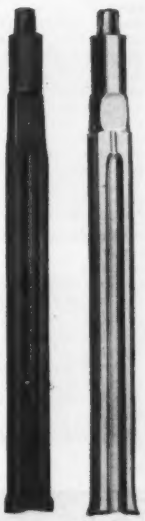
Political and economic freedoms go together. What harms one automatically hurts the other. That's why we must prevent anything from interfering with our free, voluntary system that allows every American to choose his own vocation . . . to compete for jobs and customers . . . to spend, save or invest his money . . . to invent and improve and receive the fruits of his labors and risks.

We must also make sure that enough profit is gained on successful investments to offset the risk of loss on investments that fail. Otherwise the incentive to invest in new businesses, new inventions, new products—the "hope of profit" that enabled us to produce the world's highest standard of living—will be lost . . . and our free economy will slowly but surely grind to a halt. If that happens our free choice will also be lost.

Let's not let it happen.



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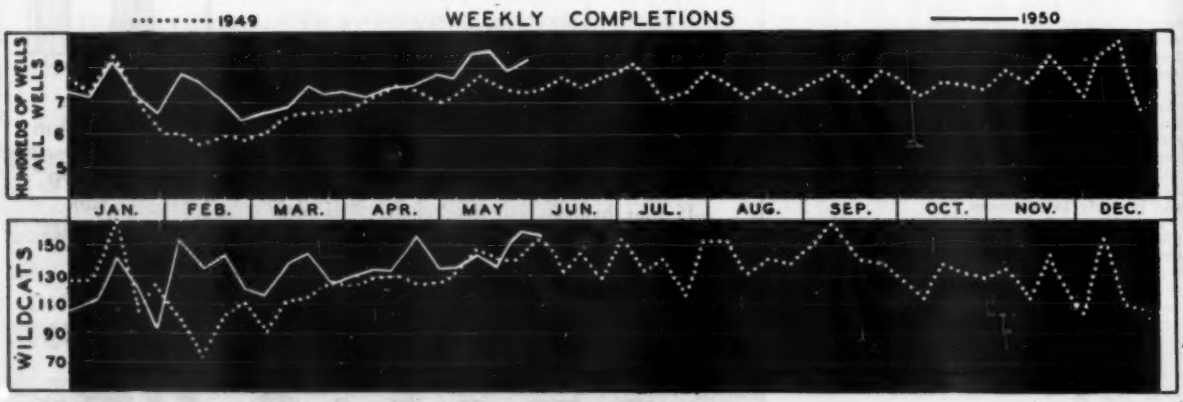
CURRENT STATISTICS

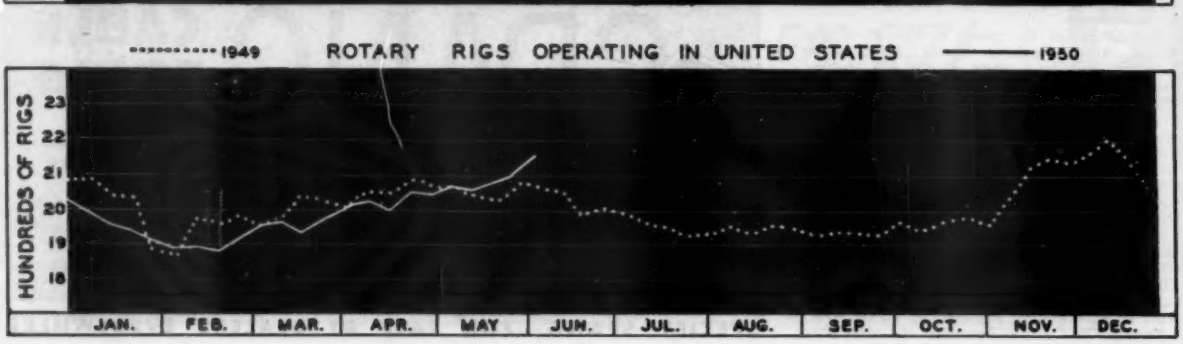
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED JUNE 3, 1950

	Total of all wells					June 3		Wildcat completions and discoveries										
													Cumulative total, 1950					
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	5	3	0	*2	6,901	186	545	0	0	0	0	0	0	0	0	0	0
Pennsylvania	15	6	3	†6	35,017	421	860	0	0	0	0	0	0	0	0	2	2
West Virginia	15	3	8	4	39,644	267	213	0	0	1	1	2	0	0	8	11	19
Ohio	20	5	6	‡9	39,446	382	481	0	0	0	0	0	1	0	1	6	8
Indiana	32	13	1	18	54,401	531	514	0	0	0	7	7	13	0	1	100	114
Kentucky	23	11	4	8	35,96[illegible]	365	364	0	0	0	2	2	6	0	1	28	35
Illinois	62	37	0	25	136,25[illegible]	985	950	1	0	0	10	11	18	0	1	224	243
Michigan	24	7	0	§17	43,8[illegible]9	325	370	0	0	0	4	4	15	0	4	106	125
Kansas	75	37	7	‡31	255,191	1,501	1,270	5	0	0	18	23	38	0	2	238	278
Nebraska	0	0	0	0	0	33	13	0	0	0	0	0	0	0	1	14	15
Oklahoma	99	55	7	¶37	354,220	2,161	1,751	4	0	0	17	21	62	5	8	279	354
Texas	352	235	15	102	1,608,152	6,516	5,612	11	0	4	54	69	206	13	49	1,017	1,285
North Central (Dist. 7-B & 9)	88	42	2	44	246,797	2,015	1,792	7	0	2	22	31	85	2	13	380	480
West (Dist. 7-C & 8)	122	100	0	22	677,247	1,915	1,297	2	0	0	13	15	47	1	1	212	261
Panhandle (Dist. 10)	15	6	7	2	45,946	402	441	0	0	0	0	0	1	0	2	8	11
Eastern (Dist. 5, 6, & 6-P)	27	23	0	4	110,343	454	396	0	0	0	3	3	7	1	1	90	99
Gulf Coast (Dist. 2 & 3)	61	41	5	15	378,399	907	808	0	0	1	8	9	33	5	18	136	192
Southwest (Dist. 1 & 4)	39	23	1	15	149,420	823	878	2	0	1	8	11	33	4	14	191	242
Louisiana	36	26	1	9	73,131	985	841	0	0	0	2	2	25	8	4	79	116
Northern	21	15	1	5	58,871	510	427	0	0	0	1	1	4	1	1	33	39
Southern	15	11	0	4	144,260	475	417	0	0	0	1	1	21	7	3	46	77
Arkansas	6	5	0	1	14,624	153	123	0	0	0	1	1	3	0	0	35	38
Mississippi	8	5	0	3	56,628	139	159	0	0	0	2	2	7	2	0	49	58
Southeastern States	1	0	0	1	3,351	27	21	0	0	0	0	0	0	0	1	17	18
Montana	0	0	0	0	6	67	83	0	0	0	0	0	1	0	0	9	10
Wyoming	7	5	0	2	41,387	223	237	0	0	0	0	0	7	0	0	24	31
Colorado-Utah	0	0	0	0	0	26	50	0	0	0	0	0	0	0	0	21	21
New Mexico	8	5	1	2	37,980	262	240	0	1	0	1	2	9	1	0	23	33
California	38	27	0	11	191,271	715	1,124	0	0	0	10	10	10	0	2	147	159
Miscellaneous	0	0	0	0	0	6	13	0	0	0	0	0	0	0	0	6	6
Total United States	826	485	53	288	3,027,419	16,276	15,837	21	1	5	129	156	421	29	83	2,435	2,968
Total previous week	794	432	64	296	2,928,866	....	....	20	1	3	137	161	400	28	78	2,306	2,812
Total June 3, 1949	775	430	44	301	2,722,041	....	....	25	4	3	124	156	380	39	73	2,250	2,742

Service wells included: *2, †6, §1, ‡7, ¶5.





DAILY AVERAGE PRODUCTION FOR WEEK

	June 3 crude oil	B. of M. May demand	May 27 crude oil
Alabama	1,750	1,000	1,750
Arkansas	78,350	86,000	78,750
California	857,600	845,000	856,400
Colorado	59,100	63,000	60,900
Eastern	61,750	60,800	61,600
Florida	1,100	1,100	800
Illinois	176,800	182,000	175,100
Indiana	29,500	27,000	30,300
Kansas	282,800	280,000	282,300
Kentucky	26,400	25,000	26,200
Louisiana	537,050	550,000	521,650
North Louisiana	117,200	.....	120,450
South Louisiana	419,850	.....	401,200
Michigan	46,400	45,000	48,300
Mississippi	100,300	102,000	101,550
Montana	22,000	25,000	23,600
Nebraska	1,500	2,200	1,450
New Mexico	126,350	139,000	126,125
Oklahoma	424,700	425,000	415,650
Texas	2,151,875	2,090,000	2,085,100
Dist. 1 (Southwest)	27,750	.....	27,400
Dist. 2 (Southwest)	126,400	.....	121,850
Dist. 4 (Southwest)	200,975	.....	194,500
Dist. 3 (Gulf Coast)	387,825	.....	376,525
Dist. 5 (Eastern)	32,525	.....	31,525
Dist. 6 (Eastern)	85,075	.....	82,575
East Texas field	270,375	.....	262,000
Dist. 7-C (West)	51,950	.....	51,000
Dist. 8 (West)	669,175	.....	640,250
Dist. 7-B (W. Central)	67,950	.....	67,000
Dist. 9 (N. Central)	140,125	.....	139,000
Dist. 10 (Panhandle)	91,750	.....	91,475
Utah	3,400	3,000	3,300
Wyoming	163,100	147,000	161,500
Total United States	*5,151,825	5,100,000	5,062,375
Change from previous week, up	89,450		
Canada	60,900	.....	60,850

Total U. S. production January 1-June 3 ..... †770,944,720 bbl.
Same period last year (crude plus cond.) ..... 804,580,995 bbl.

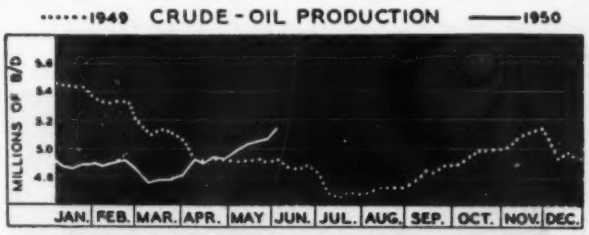
*Not incl. 103,170 bbl. condensate. †Incl. 14,871,045 bbl. condensate.

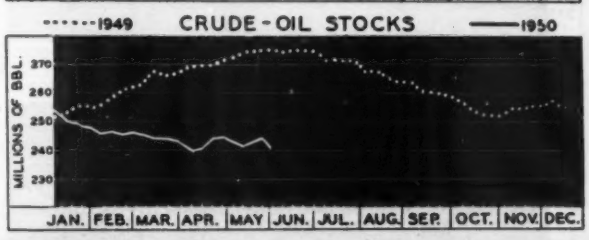
CRUDE-OIL STOCK BY STATES OF ORIGIN*

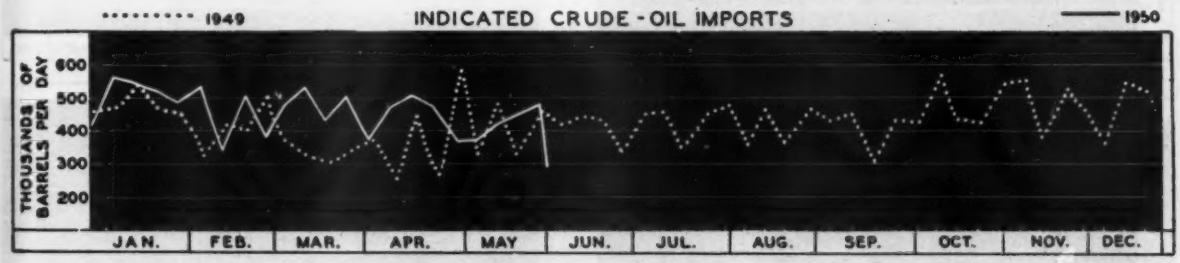
(Thousands of barrels)

	May 27, 1950	May 20, 1950	May 28, 1949
Pennsylvania Grade	2,908	2,901	3,102
Other Appalachian	1,670	1,807	2,030
Illinois, Indiana, Michigan	8,970	9,019	14,374
Arkansas	2,875	2,923	2,970
Louisiana	14,945	15,193	15,210
North	3,817	3,522	3,260
Gulf	11,128	11,671	11,950
Mississippi	2,077	2,466	3,339
New Mexico	5,983	5,974	7,404
Oklahoma and Kansas	36,004	35,729	39,673
Texas	110,294	110,490	129,861
East Texas	15,077	14,995	17,874
West Texas	40,284	40,322	51,848
Texas Gulf	27,444	27,827	31,231
Other Texas	27,489	27,346	28,908
Rocky Mountain	13,160	13,344	13,693
California	36,661	36,886	35,138
Foreign	5,295	6,292	8,396
Total	240,842	243,024	275,190

*Bureau of Mines.







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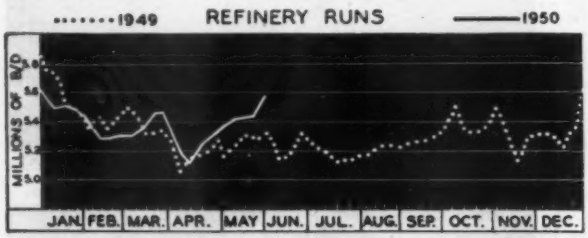
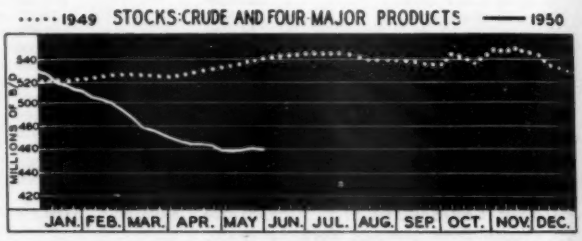
A.P.I. REFINERY REPORT, MAY 27

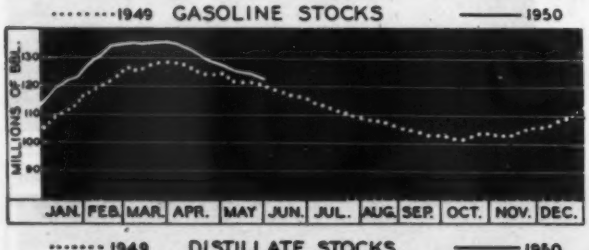
(Thousands of barrels)

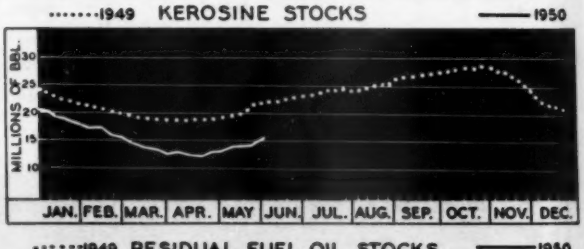
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, May 1949				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	945	394.3	32.3	211.6	202.4	26,181	5,402	9,681	9,247	751	317.7	21.3	145.7	172.0
Appalachian:														
District 1	92	40.4	4.9	13.0	10.0	2,577	332	453	301	90	40.2	3.5	8.6	10.5
District 2	77	32.3	4.3	8.0	15.6	921	90	122	151	58	31.6	2.1	4.1	10.7
Ind., Ill., Ky.	997	527.7	69.6	156.1	140.6	24,515	2,803	5,628	2,507	910	493.8	48.4	111.8	143.1
Okla., Kans., Mo.	488	260.7	13.4	104.4	54.6	13,415	852	3,345	966	413	226.0	22.1	78.6	60.8
Inland Texas	228	143.9	13.4	30.8	44.6	3,486	313	840	723	222	155.1	12.0	19.2	47.0
Texas Gulf Coast	1,185	545.6	106.3	232.6	214.6	19,319	2,673	6,278	4,121	1,203	630.7	68.0	183.9	213.4
La. Gulf Coast	478	240.8	60.1	91.6	51.7	5,966	2,055	2,458	1,905	407	208.6	34.8	93.4	43.7
N. La. and Ark.	72	23.7	7.6	14.8	14.0	2,872	312	499	189	81	31.0	6.0	14.4	18.3
Rocky Mountain:														
New Mexico	13	7.6	.4	1.9	2.8	121	25	54	33	13	6.9	0.4	1.7	3.3
Other Rocky Mtn.	165	78.0	3.0	33.3	29.1	4,998	302	1,402	488	147	70.1	4.4	26.0	30.8
California	851	377.0	17.1	130.6	280.1	18,386	916	9,847	18,677	900	373.7	14.5	125.5	384.4
May 27, 1950	5,591	2,672.0	332.4	1,028.7	1,060.1	122,757	16,075	40,607	39,308	5,195	2,585.4	237.5	812.9	1,138.0
May 20, 1950	5,477	2,654.3	305.7	1,009.7	1,062.1	124,669	14,648	39,432	39,330	.....	.....	.....	.....	.....
May 28, 1949	5,297	2,617.7	221.4	849.0	1,163.4	120,661	20,953	55,971	63,168	.....	.....	.....	.....	.....

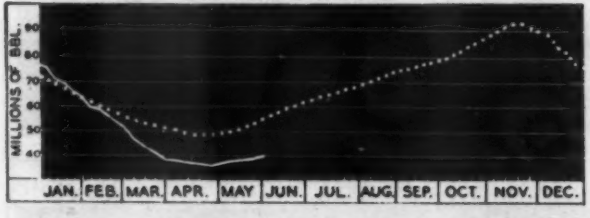
*At refineries including natural blended. †Finished and unfinished.

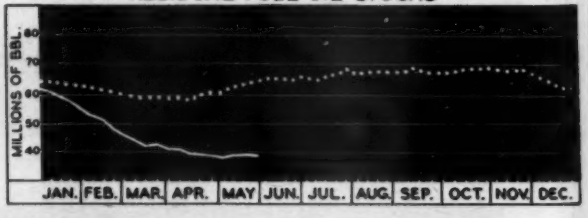


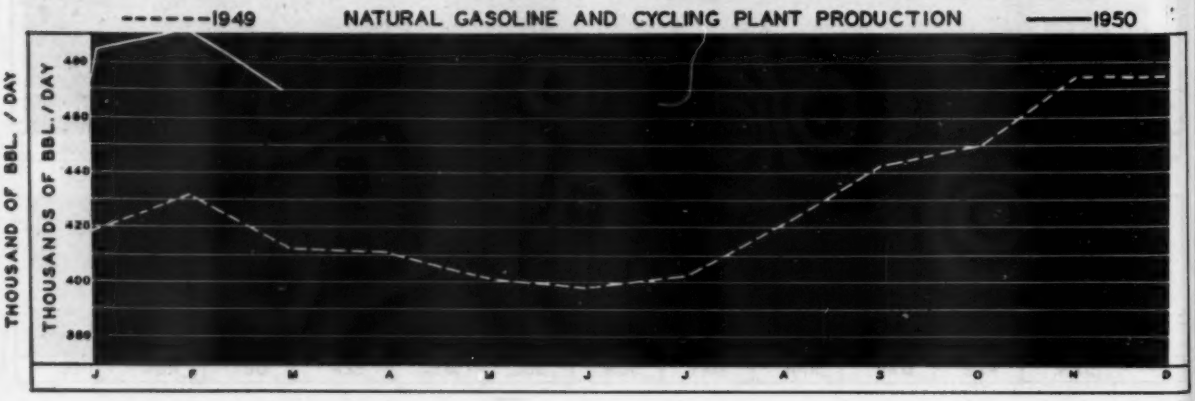












CRUDE PRICES

GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.53			
19-19.9	1.63			
20-20.9	1.73	$2.25	..	$2.12
21-21.9	1.82	2.27	..	2.14
22-22.9	1.92	2.29	..	2.16
23-23.9	2.02	2.31	..	2.18
24-24.9	2.12	2.33	$2.56	2.20
25-25.9	2.22	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.65
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

ADDITIONAL increases in tank-wagon prices for gasoline in the Midwest are furnishing further proof of the firmness of the general gasoline market. The recent increases are for the most part in Indiana and southern Michigan where prices were not advanced at the time of the general May increase. Most of the Indiana changes amount to 1 cent a gallon, bringing prices back to the level that existed before the reductions in March.

Group 3 spot prices for gasoline remained unchanged during the week but the market continues very strong. Suppliers are reporting good demand for gasoline in northern Texas and southern Oklahoma as the harvest season moves north.

Reports indicate that the price-protection policy, covering summer sales of distillate fuel to home owners, is moving into areas of the Midwest. Socony-Vacuum Oil Co. announced a price-protection plan for metropolitan Chicago, stating that the home owner will receive the benefit of any price reductions between June 1 and August 31. So far this year, all promotions for summer heating-oil sales have offered only protection against price drops. No summer discounts have been reported. The general market reaction is that there will be no summer discounts since most primary suppliers can care for seasonal additions to stocks even if reseller and consumer purchases are below normal.

Gasoline prices in the New York Harbor area ranged higher with several suppliers withdrawing quotations of 11.5 cents a gallon for barge deliveries.

Gulf-East Coast stocks of residual fuel are about 25 per cent lower than at this time last year. However, current prices are just below the break-even point with coal, and a major price increase would drive some business back to coal.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of June 5, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅛-10⅜	11.9-12	10⅜-10¾
Premium gasoline, 86-88 octane	10¾-11½	13	11¼-11½
42-44 w.w. kerosine	8½-8⅝	9.1	8-8½
No. 2 straw fuel oil	7⅝-7¾	7.6-8.0	7-7¼
No. 6 residual	$1.65-1.75	$2.05	$1.65-1.80

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5⅛	4⅝	4⅞
Grade 18-55	6.15	5.65	5.9

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	10.5
750 vis., No. 3-4 neutral	12.75
2,000 No. 5-6 neutral	14-14.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	18-18.5
200 vis., No. 3 neutral, 0-10 pp.	12.5

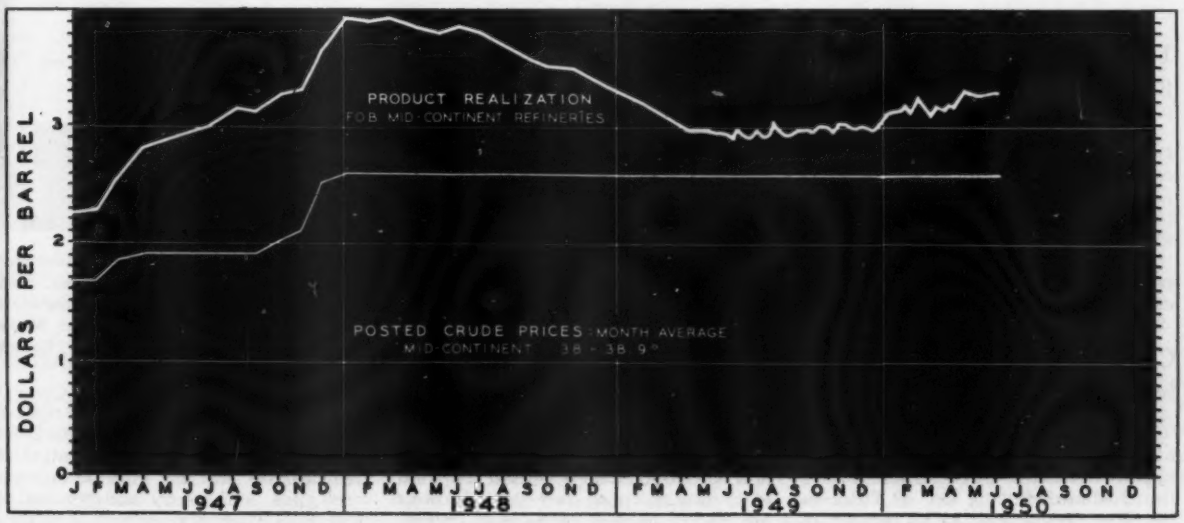
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	20.5
180 vis., 0 p.t. neutral	21.5

WAX

Mid-Continent

132-134 A.M.P.	4.50


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
J F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.32 for week ended May 27, $3.33 por previous week, and $2.98 for May 1949.

XUM

EQUIPMENT MEN . . . in the News

Two Sales Engineers Added To Mid-Continent Staff

G. H. HUFFHINES

J. C. JOHNSON

Ken W. Davis, president and general manager of Mid-Continent Supply Co., has announced the addition of two new sales engineers to the Mid-Continent staff. G. H. Huffhines has been named sales engineer for the Mid-Continent division office at Shreveport, and J. C. Johnson has been appointed a sales engineer for the company's division office at Tulsa.

Huffhines began his career in 1937 at Pampa, Tex., as district engineer for a supply company. In 1946 he became district engineer with an oilfield supply company at Shreveport. He attended Texas A. & M. College and was graduated in 1937 with a bachelor of science degree in mechanical engineering.

Johnson also received his engineering education at Texas A. & M. From 1937 to 1941 he was employed in the diesel-engine division of a Chicago firm and from 1941 to 1950 he was associated with a supply company in Tulsa.

Trilsch Moves to Own Building in Houston

John D. Trilsch Co., general contractor and tower-erection firm, has announced the removal of the company offices from the M & M Building to its own building located on McKinney Avenue in Houston.

The move to larger quarters was necessitated by the need for giving customers a more complete service.

Cranfill Joins Baird In West Coast Area

President Harold Sheridan has announced that John Cranfill has been appointed sales representative for Baird Manufacturing Co. of Tulsa in the West Texas area to be located in Pampa, Tex.

Cranfill has received extensive training in the Tulsa plant, and is well acquainted with the manufacturing processes of the Baird line of oil production equipment. He will serve a large territory covering West Texas, Pampa-Borger area, and New Mexico.

R. M. Nee Named to Tulsa Post for Koppers Division

R. M. NEE

James R. Gibbons, special representative of the Tar Products division, Koppers Co., was in Tulsa attending the spring meeting of the Natural Gas Department of the American Gas Association, May 8-9. He was accompanied by J. J. Clancy, Chicago, assistant district manager of the division.

During their visit, the company announced the appointment of Robert M. Nee as sales manager, midwestern district, with headquarters in Tulsa. Nee succeeds Frank E. MacNulty, who recently resigned his position with the company.

Chiksan Adds Three New Representatives

G. R. Winder, vice president and sales manager, Chiksan Co., Brea, Calif., has announced the return to Brea of H. J. Schlarb, assistant sales manager, who has completed an extensive trip throughout the oil fields of the United States; and the appointment of three new Chiksan representatives.

Robert S. Hudgins, Jr., Charlotte, N. C., will cover North and South Carolina. R. S. Stover Co., Marshalltown, Iowa, has been appointed to cover the states of Iowa and Nebraska. George S. Thompson Co., Phoenix, has been named representative for Arizona.

St. Clair Elected Vice President by Lunkenheimer

Clinton D. St. Clair has been elected vice president in charge of manufacturing by directors of Lunkenheimer Co., Cincinnati. St. Clair, who joined Lunkenheimer in 1947 as works manager, will supervise all manufacturing operations for the 88-year-old valve company.

Keystone Holds Annual Sales Meeting in Houston

Attending Keystone's 2-day sales meeting were: front row, J. C. Stillwagon, assistant secretary and treasurer; Jim Scroggins, Shreveport; Paul Ribb, Houston; Bill Ramsey, plant superintendent; L. S. Hamer, president, Hamer Oil Tool Co.; and C. K. Stillwagon, president, Keystone Tool Corp. Back row: Bruce Pettit, secretary; Al Ferguson, Baton Rouge; Walter Smith, Odessa; G. T. White, Bucatunna, Miss.; Ralph Stockton, Houston; L. M. Gay, Gretna, La.; Ben Landes, Coors Porcelain Co.

Keystone Tool Corp. held its first annual sales meeting at Houston to acquaint its representatives with its new products which consist of fluid end pistons, pony-rod combinations for power pumps, lube-seal unions, ceramic bubble caps and Raschig rings, and back-pressure valves.

Keystone is also representative for Hamer Oil Tool Co., manufacturers of blind and plug valves, and for Gil-Lair Products, Inc., fabricators of ball-bearing swivel pipe couplings, mud guns, and rotary and cementing hose. L. S. Hamer, president of Hamer Oil Tool, and B. D. Landes, representative of Coors Porcelain Co., also attended the meeting.

Filtrol Corp. Occupies New Los Angeles Quarters

S. R. FUNSTEN

W. W. GARY

Wright W. Gary, president, and S. R. Funsten, manager of sales, Filtrol Corp., manufacturer of catalysts, adsorbents, desiccants, and other chemically treated materials, has announced the moving of the firm's new national headquarters to 727 West Seventh Street, Los Angeles.

In conjunction with the expansion program, Gary and Funsten said the firm's growth can be attributed to its extensive research and development program and to a growing demand for its products by the petroleum and allied industries.

W. R. Kern Named Sales Manager for Winslow

W. RAY KERN

Appointment of W. Ray Kern as sales manager of Winslow Engineering Co., manufacturers of Winslow filters and elements, has been announced by William G. Nostrand, vice president in charge of sales and engineering for the Oakland, Calif., firm.

Kern assumed his new duties on May 15 after resigning as vice president and general manager of Berglund Tractor & Equipment Co. He had spent the past 15 years with the Berglund organization. The new Winslow executive, who will make his headquarters in Oakland, plans an early trip throughout the United States and Canada to visit Winslow distributors.

Gil-Lair Names South American Representatives

Lee J. Laird, vice president and sales manager of Gil-Lair Products, Inc., Pasadena, Calif., has announced the appointment of the following representatives to handle the company's sales and services in South American countries.

Appointments of manufacturer's representatives for South America are as follows: In Venezuela, R. W. Mace, Maracaibo, Venezuela. In Brazil, Peru, and Chile, South American Supply Corp., Lima, Peru. The above representatives will handle the entire line of Gil-Lair products.

Ford and Cassel Join Reading-Pratt & Cady

Glenn S. Ford and A. B. Cassell, Jr., have joined Reading-Pratt and Cady valve division, American Chain & Cable Co., Inc. Ford will represent the firm's district office at Shreveport, and Cassell will represent the district office at Fort Worth.

United Centrifugal Names Lobanoff Chief Engineer

V. LOBANOFF

V. Lobanoff has been appointed chief engineer for United Centrifugal Pumps, division of United Iron Works, according to a recent announcement. During recent years, Lobanoff has been credited with major responsibility for development of a number of new United Centrifugal Pump designs, and a program to affect maximum interchangeability of parts in each line. In his new post, he will continue to direct new-design development.

Seaberg Represents Middle West in West Coast Sales

GROVER SEABERG

Grover Seaberg, formerly in business for himself, has recently joined Middle West Coating & Supply Co. as West Coast representative.

Seaberg began his career over 30 years ago as a chemist for the People's Gas Light & Coke Co. of Chicago. His next job was field engineer for Dresser Coupling Co. of Bradford, Pa., contacting with major oil, gas, and water companies from coast to coast. He was with Dresser for 15 years. His next move was to the Pittsburgh Equitable Meter Co., where for 3 years he was in charge of sales of all special fittings.

During the next 2 years Seaberg had charge of all pipe sales for Walworth Co. out of New York. For the past 10 years he has lived in California, where he had established his own foundry.

Union Wire Rope Opens Two New Branches

Union Wire Rope Corp. has established offices and warehouses at Dallas and at North Sacramento, Calif. These make a total of 12 fully stocked and staffed branches functioning as distribution links between factory, distributors, and users.

Large Shipment of Pipe Arrives at Culbertson Plant

This barge, containing nearly 100,000 ft. of 5½-in. casing, weighing approximately 1,600,000 lb., is the first of 10 such shipments to be routed into the Syd E. Culbertson plant at Houston, for threading and coupling for use in Gulf Coast oil wells. Shop work is being done on this pipe by Culbertson by arrangement with Dresser Industries and Texas Steel & Tubes Co. This is said to be the largest single barge load of pipe to come down the Mississippi and Intercoastal Canal

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CLASSIFIED ADVERTISING

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
10% Discount three or more issues.

UNDISPLAYED CLASSIFIED 12c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

EQUIPMENT FOR SALE

ONE new 40′ x 40′ x 12′ corrugated aluminum building; double sliding door; single door and window; steel structure. Located: Bunkie, Louisiana. Anchor Gasoline Corp., Phone 54-5201, Tulsa, Oklahoma.

1 COMPLETE String of Rotary Drilling Tools: Ideal Drawworks, Wheland Clutch, 7¼ x 14 New Type Wheland Pump, Waukesha Motors, 3600′ 4½″ Drill Pipe, 122′ Lee C. Moore Champion Rotary Derrick, Tool House and all necessary equipment goes with this rig. Anyone interested either write H. M. Williams Drilling Company, 701 Bitting Building, Wichita, Kansas, or telephone 48542.

1—Shot Hole Drill Truck, Chassis WHAX 1947 Dodge, Mayhew Drilling Unit—Model 600 Complete w/ Gardner-Denver 4½x5 mud pump. Mast 19 feet—Kelly 12½ feet. 100 feet 2⅜″ Used Drill Rod. 3—Dodge Water Trucks: 2 Ton Chassis WHAX—2 Ton, 400 Gallon Tank, Tulsa 18—Winch. 1—Model DDH—Oliver Cletrac Tractor w/ Hercules 6 cylinder Diesel Engine, Electric Starter and battery ignition complete with southwest cable controlled trailbuilder and Buckeye Double Drum Power Control Unit. If interested, write or call The Atlantic Refining Company, c/o Mr. V. H. Gray, P. O. Box 2819, Dallas, Texas, Telephone P7-6484. Station 8-273, Dallas.

FOR SALE: One 150 HP Type DFXE Hercules Diesel Engine; 1800 RPM; 150 Hours total time; bargain. We buy and sell Pumps, Engines, Boilers, Compressors, Generators. Kinslow Power & Equipment, Inc., 817 South Boulder, Tulsa, Oklahoma.

FOR SALE: Portable deep well servicing rig. Cardwell model H, code HSMZS, serial No. HS-951, single drum hoist with 8″ x 7″ telescoping mast. Powered with 6MZ Waukesha with gas-gasoline carb., regulators and volume tank. Unit is mounted on 1946 model 25 VBS 5 ton Reo truck. This equipment in good shape and has had very little use. $8750.00. Marena Oil Co. Box 720, Cut Bank, Montana.

NEW STEEL PIPE

20″ — 26″ & 31″ O.D.

1000 feet of each available

Also

100,000 feet—1″ Standard Black

Reconditioned Pipe

T. & C. or P. E.

Write—Wire—Phone

SONKEN-GALAMBA CORPORATION

2nd and Riverview (X-802)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

COOPER Single Drum Winch Tractor, Model W-201-26, with 45-foot mast, A-1 condition. $2250.00. Rogers Pipe & Supply Co., Tulsa, Phone 3-2072.

FOR SALE: Wilson Mogul drilling rig with portable derrick complete. Suitable for 4500′ depth. Now running in Bebee Field, Pontotoc County, Oklahoma. Contracts available. Lake Oil Company, Ada, Oklahoma.

SPUDDERS: Good used equipment. Fort Worth Models Super H. and C. Wichita 55. Wilson rotaries. Franks and Longyear machines. New and used tools and supplies. Fishing tools rented. Everything for well drilling. Pressey & Son, Pueblo, Colorado.

FOR SALE: National "75" with 2 Engine Rig Drive, Wilson "Giant" with Dual Engine Drive, RX1SV 12-Cyl. LeRoi, Two RX1V 8-Cyl. LeRois, C-12 (7¼x12) Emsco Power Pump, D-13000 Caterpillar, PA-100 International, WOKU Waukesha, Radiator for WAKU Waukesha. Jones, Shelburne & Guffey, Inc., 501 N.E. 26th, Oklahoma City, Oklahoma. Phone: 5-5448.

FOR SALE

9 tons Johns-Manville 7TF5 Asbestos Fibre. $37.50 per ton f.o.b. Bartlesville, Oklahoma.

Contact: LEO CARLE

H. C. PRICE CO.
Box 1111, Bartlesville, Phone LD-8

WE OFFER SUBJECT TO PRIOR SALE

2—77,000 bbl. steel tanks, riveted shell and bottom. Welded steel cone roof, supports, 114′ dia. x 42 ft. high, Shidler, Okla.

6—25,000 gal. horizontal steel storage tanks, 10′6″ dia. x 40′6 ft. overall welded construction, ⅜″ plate, 7/16″ flanged and dished heads, Franklinton, La.

3—55,000 bbl. steel storage tanks, 117′ dia. x 30 ft. high, riveted construction, near Marietta, Penna.

1—37,500 bbl. steel storage tank, 96′8″ dia. x 29′11″ high, riveted construction, near Lebanon, Ohio.

ROGERS AND WRIGHT, INC.
Ph. 5-3228
Tulsa, Oklahoma

EQUIPMENT FOR SALE

CULVER Vertical Furnaces for exfoliating Perlite $10,000 compared to $100,000 for old style, also purest of Perlite for sale. Particulars Box 2153-OJ, Denver, Colo.

FOR SALE: One, type-100 National Drilling Rig has drilled only two wells. With 800,000 pounds capacity jack-knife derrick. Box D-448, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE at our Lacy Plant, Seminole Field, 3—10′ x 40′ Horizontal Welded and Riveted Gasoline Storage Tanks. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

BARGAIN FOR QUICK SALE

Large Steam Rig Complete Ready to go. 14x14 Engine, 18″ & 20″ Pumps, 10,000′ 4½ Drill Pipe, 136′ Drk All 300 Ton Equipment. Everything Good Condition. **McDaniel & Beecherl Drlg. Co.**, 521 Republic Bank Bldg., Dallas, Texas, or Phone 3651, Odessa, Texas.

Several Army Surplus 4½″ x 6″ Gaso Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

COMPLETE PORTABLE DRILLING UNIT

1—K-11 I.H.C. Drill Truck with Failing #55 Drill equipped with 54 Ft. mast, complete with all tools.

1—KB-10 I.H.C. Pump Truck with 1 5″ x 10″ Wheatley Pump & 1—5″ x 6″ Gardner-Denver Pump mounted on truck. Pumps are equipped for slush service.

1—4-Wheel Trailer with Tool House mounted on Trailer.

3,000 Ft. 2⅞″ OD Drill Pipe with 4½″ OD Tool Joints.

1—KS-8 I.H.C. Water Truck with 1,000 gallon tank.

All of the above equipment is complete, in excellent condition, and ready to drill; located in Tulsa, Oklahoma.

Contact
W. B. KENDALL
2507 No. Boston Pl.
Tulsa, Oklahoma, Telephone 3-6251.

12,000 ft. 6⅝ O.D. Seamless #17.65 at .75c ft.
46,000 ft. 6⅝ O.D. T.C. Lapweld #19.45 at .80c ft.
150,000 ft. 6⅝ O.D. New Range 3 Elec. Weld #17.02
50,000 ft. 12¾ O.D. New Seamless #41.51 Nat Tube Make Range 3
All subject to prior sale, immediate delivery.
Dismantling 50-55,000 Bbl. Tanks. Sheets 5′ x 15′ & 6′ x 20′
From 3/16″ to ½″ Plates included. Sell any part.
W. C. BERRY, TULSA, OKLA., PHONE 3-6141

EQUIPMENT FOR SALE

BOILERS FOR SALE: 18 Code Oil Field Boilers, 50 to 87 H.P., 100 to 200 Lbs. W.P., Operated under Hartford into 1948, not fired since. Located on Leases vicinity Pampa, Texas. Offered subject to prior sale $500.00 to $700.00 Each, as is where is. Contact W. L. Godfrey or Max Harbison, Kewanee Oil Company, Pampa, Texas.

FOR SALE: One 7¼ x 14 Whelan model 11000 Slush pump. New fluid end, gear box A-1. Melton Supply Company, Box 1360, Seminole, Oklahoma.

FOR SALE: Boilers, Tanks & Pumps. 15 new vertical 500 bbl. bolted tanks, crated. 4 used 100,000 gal. 9/16" plate. 4—67,500 gal. ¼" plate. 2 new Deming Deep Well Pumps with Sheppard Diesel, 100 gpm @ 100' head with casing and spare parts. 1—100 H.P. Farrar & Trefts Locomotive Boiler 300# w.p. with stack and grates. H. Loeb & Son, 4643 Lancaster Ave., Philadelphia 31, Pa.

FOR SALE: Model L-107 Allis-Chalmers Fred E. Cooper winch unit for deep well servicing. Excellent condition. Priced to sell. Degen Pipe & Supply Co., Box 107, Red Fork Station, Tulsa, Oklahoma.

FOR SALE: New 1¼" Improved plow steel wire lines 6 x 19 R L Hemp Core. One Spool 3500' at 28c per ft. Four Spools 1800' at 24c per ft. Thirty Spools 600' at 20c per ft. FOB Okla. City, Okla. General Tool & Supply Co. P.O. Box 4387—1319 S.E. 29th. St., Okla. City, Okla.

FOR SALE: One Gumbo Buster 26" Oil Bath rotary table in good running condition. Attractive price. Melton Supply Company, Box 1360, Semniole, Oklahoma.

BARGAIN

4—100 HP Superior Twin Gas Engine COMPRESSORS—now operating in Oklahoma. Alfred B. Kern, 223 Wright Bldg., Tulsa, Oklahoma.

FOR SALE: Wilson Giant draw works, powered by two JL-1335 Buda engines with Wilson chain compound. Unit completely overhauled. Can sell separate or with a complete rig. For information, call or write Melton Supply Company, Box 1360, Seminole, Oklahoma.

EQUIPMENT

100 OCTANE REFINERY

Cotton Valley, La.

5—Upshot heaters — U.O.P. type Vogt—Kellog—G-R exchangers & condensers. Fractionating columns. Drums and pressure vessels.

I-R—B-J—National Transit—Union — Hills-McCanna—Worthington centrifugal, reciprocating, steam, turbine and motor driven pumps.

SEND FOR COMPLETE LISTINGS

DULIEN STEEL PRODUCTS, INC.
of Washington
P. O. BOX 667
COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

EQUIPMENT FOR SALE

AUCTION

QUITTING BUSINESS

Wed., June 21st, at 10:00 A.M.

H. J. Uhl Trucking Company

(Oil Field and Heavy Machinery Hauling Equipment)

Original Cost Over
$400,000.00

RUSSELL, KANSAS

West edge of city on US Highway 40

Company quitting business and has ordered I.C.C. OIL FIELD AND HEAVY MACHINERY HAULING PERMITS, heavy hauling equipment, tractors, trucks and trailers, shop equipment, machinery and buildings sold piece by piece to the highest bidders for cash. WILL NOT BE OFFERED AS A WHOLE. Most of this equipment is in excellent or good operating condition, as the company maintained all rolling stock in their own shops. This is one of the largest auctions of this kind to be sold in the Middle West and it will pay you to travel a distance to attend.

I.C.C. IRREGULAR HAULING PERMITS

I.C.C. 43362 OIL FIELD:—pipe line and heavy machinery authority between points and places Kansas and Oklahoma, points and places in Kansas on one hand and on the other points and places, in Arkansas, Colorado, Illinois, Louisiana, Missouri, Nebraska, New Mexico, Texas and Wyoming.

SUB.-8-BULKY commodities between Kansas City, Mo., and Kansas, on one hand Oklahoma, Nebraska, Colorado, Missouri, Illinois and Texas on the other.

HAULING PERMITS WILL BE SOLD AT 1:30 PM IN LOTS OF CERTAIN STATES as permitted by the I.C.C., AND ALSO OFFERED AS A WHOLE. 25% DEPOSIT ON PERMITS REQUIRED ON DAY OF SALE TO BE HELD IN ESCROW UNTIL TRANSFER TO BUYER IS COMPLETED.

64 Tractors, trucks, semi-trailers, trailers and bolster pole trailers, machinery and equipment.

Attention Pipeliners—2 side boom Caterpillars and other pipeline specials. Write, wire or phone.

Gross Auction Co.

3542 Main St. **Phone WE. 5333**

Kansas City, Mo.

EQUIPMENT FOR SALE

USED ROTARY AND CABLE TOOL DRILLING TOOLS, WIRE LINES. E. A. KELLY, BOX 861, OKLAHOMA CITY. PHONE 5-6407.

FOR SALE: 1—36-L Bucyrus Rig, 1948 model, complete with all tools. Phone 2032, Henderson, Kentucky.

FOR SALE: In our Geological Department here, 3 large mahogany Wall Map Cases. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

FOR SALE in Siler Trucking Company's Yard, Craig, Colorado, 828' of new 6⅝" OD 24# 8 RT, J55 ST&C SS Casing. $2.00 per foot. Cities Service Oil Co., Patridge, Bartlesville, Okla.

WAR SURPLUS MACHINERY

Gaso, Byron Jackson, Aurora, Wayne, Lombard & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

FOR SALE
(SUBJECT TO PRIOR SALE)

3 Bolted tanks, 2 in original crates and one assembled, (100 Bbl.). 69'-14" 57# Drive Pipe; 170'-10¾" 41# Drive Pipe; 407'-10¾" 32.75# Casing 8Rd. Thd. Smls.; 3045'-8" 24# Casing 8Rd. Thd. Smls.; 6286'-7" 23# Casing 8Rd. Thd. Smls.; 8101'-3" 9.20# Tubing Smls.; 1453'-2½" Tubing EUE Smls.; 14,226'-3" 6.40# Regular 10Rd. Thd.; 375'-¾" Pumping rods; 9-5" Orbit Gate Valves; 9-3" Orbit Gate Valves; 3-2" Orbit Gate Valves; 3-2⅛" x 6" Parmco Combination Packer; 1-2⅛" x 6" Larkin Screw Trip Packer; 1-3" x 6" Parmco Packer; 1-2⅞" x 6" Gas Anchor Packer. M. B. Belden Office at 425 2nd St. N. W., Canton 2, Ohio, Phone 4-6147.

FOR SALE OR LEASE

LOCOMOTIVES

2—100 ton 660 HP Baldwin diesel electric, four traction motors.
1—65 ton Whitcomb diesel electric new 1942, excellent condition.
1—50 ton Whitcomb 300 HP diesel electric, tractive effort 30.000#.
2—30 ton diesel operated switching locomotives new 1942, Full ICC.
1—50 ton Vulcan 0-6-0 side tank steam switcher, new 1942.
1—80 ton American 0-6-0 steam switcher, tender type, new 1942.
5—Type 2-8-4 steam road engines new 1940, finest condition.

LOCOMOTIVE CRANES

2—30 ton, diesel operated, new 1942.
3—40 ton, diesel operated, new 1942
2—25 ton American, steam, new 1942.
1—25 ton, Ohio, steam, new 1942.

CARS

50—all steel 70 ton capacity hopper.
25—Composite type box, 40 ton capacity.
19—all steel, 20 cu. yd. air dump cars.
Private Car — Completed January 1950.

SPECIAL!

36" Gauge equipment—45 ton Whitcomb diesel electric locomotive, Baldwin 50 ton steam locomotive new 1930, Five 30 ton steam switchers, 34 Western 5 cu. yd. dump cars.
90" Niles Wheel Lathe, new 1944.
110' Turntable—fine condition.

Our stock includes many other locomotives, cars, cranes and heavy equipment items. We invite your inquiries.

WRITE — PHONE — WIRE

Pan-American Engineering Co.

P. O. Box 2576 **Telephone L.D. 339**
Dallas, Texas

EQUIPMENT WANTED

INTERESTED in small portable doublemast rig, capable of drilling to approximately 2000 feet, with or without drill pipe. Equipment must be in good condition and reasonably priced. Preferably located in Southwest Texas. Contact:

MAKIN DRILLING COMPANY
Box 131, Hobbs, New Mexico, Phone 131

XUM

EQUIPMENT WANTED

WANTED
CATERPILLAR SCRAPERS
Models 70 and 80
JOHN FABICK TRACTOR CO.
3100 Gravois Ave.
Phone: Laclede 8900 L.D. 5
St. Louis 18, Mo.

HELP WANTED

WANTED: SEISMOGRAPH PARTY CHIEFS—For field work in Alberta, Canada. Single or married men, no children, preferred. Minimum two years party chief experience required with university geological or geophysical background. Salary open based on experience and general ability. Excellent opportunity for men willing follow field work. Box D-531, The Oil and Gas Journal, Tulsa, Oklahoma.

QUALIFIED Magnetometer Operator-Party Chief for South America. All expenses for wife and family. Qualified personnel only apply. Exploration Surveys, Inc., 5615 Daniels Ave., Dallas, Texas.

GAS ENGINEER WANTED
By consulting engineering firm located in New York City. Applicant should have had experience with either transmission or distribution of natural gas. Analytical ability desired in connection with certificate and rate work. Age 35-45. Reply giving age, education, experience, references and salary required. All replies kept confidential. Write Box D-487, The Oil & Gas Journal, Tulsa, Oklahoma.

SALES ENGINEERS
OPERATIONS SUPERVISORS
PERFORATOR OPERATORS
Only Experienced Men Need Apply.
WRITE ONLY
WELEX JET SERVICES, INC.
3909 Hemphill Street, Fort Worth 9, Tex.

MUD ENGINEERS
Only experienced men in sales and servicing need apply. Good pay, with merit bonus. All replies kept confidential.
P. O. BOX 5156
Tulsa, Oklahoma

WANTED
FOR CHEMICAL PLANT
Located in South

ESTIMATORS

Must be experienced engineers, under 40, familiar with Refinery and Chemical Plant design and capable of estimating process equipment installations from flow diagrams and specifications. Give full information, experience record and salary expected.

DRAFTSMEN-DESIGNERS

Preferably with ME, CE, or EE degree, under 40, with at least three years drafting experience in Chemical or Oil Industry. Give full information, experience record and salary expected.

BOX D-530
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

LARGE responsible organization is establishing a petroleum and natural gas statistical division and desires the services of a Canadian resident geological engineer with educational qualifications and at least two/three years' practical experience. Good opportunity for right individual. Applications should be by letter to the undernoted box number, accompanied by photograph, and should include qualifications, references and state present salary if employed and, if not, last salary. Box D-513, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST wanted by old independent oil company with substantial production and financial backing. Must have varied experience in West Texas and/or other MidContinent areas, and be capable of heading department. State age, scholastic training, former affiliations, years and record of experience, present assignment, date of availability and expected salary. All applications will be held confidential. Address: Box D-518, The Oil and Gas Journal, Tulsa, Oklahoma.

EVALUATION ENGINEER—A progressive and substantial Mid-Continent oil company desires the services of a fully qualified oil property evaluation and/or appraisal engineer. State age of applicant, scholastic training, former affiliations, years and record of experience, present assignment, date of availability, and expectant salary. All applications will be held confidential. Address all inquiries: Box D-486, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED: Process Engineer, prefer one with five years or more experience. Southwest Refinery, Box D-497, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men. Salaried positions — $3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

FOREIGN and Domestic Oil Employment Directory (including late supplement of oil companies and drilling contractors in Western Canada). Over 500 listings in drilling, production, refinery, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services and refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2803, Tulsa, Okla. (Our 30th year).

SALES REPRESENTATIVES
Soundly established, progressive firm has openings for three district sales representatives. Experience in pipe, valves or fittings an asset. Excellent opportunity. Write Box D-516, The Oil and Gas Journal, Tulsa, Oklahoma, stating complete detailed background. All communications confidential.

SITUATIONS WANTED

PRODUCTION MANAGER-SUPERINTENDENT. 10 years' supervisory experience development and production in Mid-Continent and Rocky Mountains. Capable complete responsibility for drilling and production programs. Graduate Engineer. Age 36. Desire responsible connection with active organization. Now employed responsible position. Change desired due curtailment employer's activities. Record and details on request. Box D-512, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131, Ph. No. 131, Hobbs, New Mexico.

PETROLEUM Chemist-technologist, Ph.D. Family. Chief Chemist or Assistant Superintendent. 15 years' experience laboratory management, products control, research, development and technical service. Available soon. Box D-510, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED PIPELINE PATROL pilot available immediately. 5,000 hours total and 3,000 pipeline hours, or approximately 300,000 pipeline miles flown. 28 years old, married, two years pre-engineering college training, commercial pilot, single and multi-engine land, flight instructor. Reply: Ralph Palmer, 201 South Douglas, Lee's Summit, Missouri.

SITUATIONS WANTED

LANDMAN-LAWYER—Over ten years experience East Texas and Gulf Coast. Refer Box D-523, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE ACCOUNTANT, CPA Fifteen years diversified accounting and tax experience, principally in Oil Industry. Desires change. Box D-524, The Oil and Gas Journal, Tulsa, Oklahoma.

LAND MAN, 31, Legal Education, Abstract experience, Leased and perfected titles in Texas, Louisiana and Mississippi. Three years with Major Company, desires change, good reason. Go anywhere. Job must have good future. Box D-537, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST. Executive Geologist desires change. Fifteen years' experience over United States and Canada. Unusually competent in planning and supervising major exploration programs. AB and MS degrees in Geology. Now employed. Box D-521, The Oil and Gas Journal, Tulsa, Okla.

GEOPHYSICIST with Geology Degree: Member A.A.P.G. and S.E.G., 16 years experience, 6 in West Texas. Now employed, desires change with permanent location. Box D-536, The Oil and Gas Journal, Tulsa, Oklahoma.

BRADFORD man with intimate knowledge of Bradford, Oil City, Pa.; Bolivar, N. Y., Oil Fields also new Renova Gas Field can give expert representation to manufacturers who need sales supervised in these areas. Thoroughly familiar with secondary recovery problems and equipment sales. Can sell direct or push thru Supply Companies. Exceptional opportunity. Reply Box D-533, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY process engineer available in 30 days. Experienced in process design, instrumentation, operations, and economic problems. Minimum salary for southwest location $7,500 yearly. Box D-534, The Oil and Gas Journal, Tulsa, Oklahoma.

INSTRUMENT MAN: Five years' experience refinery control instrument troubleshooting, desires responsible position in this capacity. Box D-532, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorney, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa, 3, Oklahoma.

LEASE AND DRILLING BLOCKS

COLORADO Land in Lincoln Co.: 10,000 acres improved Ranch, consider Oil lease $1 acre or will sell $16 acre. Surface Niobrara, springs and well water, heavily grassed, ½ suitable for wheat; E. H. Grantham, Ordway, Colo.

HAVE proven location for shallow oil. Need few investors with $100.00 to join in drilling. Quick action. Box D-535, The Oil and Gas Journal, Tulsa, Okla.

TWO DRILLING BLOCKS
One 800 acre block along West side of White River; Knox County, Indiana; 4 North; 8 West. No. 2 block: 454 acres in Daviess County, Indiana; 4 North; 7 West. Must have Salem Test. This acreage all lies Southwest of the Plainville Pool, Daviess County, Indiana.
LEO H. GRAVES
Phone 64, Farina, Ill.

LEASE AND DRILLING BLOCKS

FOR SALE: Limited number oil and gas leases in NW Beaver County, Oklahoma, Township 6, Range 20. Contact: W. A. Franks, Route 1, Liberal, Kansas.

OFFERING 30,000 acres leases Valencia County, N. Mex., 10,000 Hidalgo County, 6,000 Torrance County, $1.50 acre—17,000 acres Wallace County, Kansas, $1. Write if interested, Box 2153, Denver, Colo.

IF you've got real oil proposition or royalty that you wish to sell, or any defaulted municipal or special assessment bonds, bring your deal to me. Dyer-OJ, 1835 Champa, Denver, Colorado.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Kentucky.

OFFERING 32000 10 yr. oil and gas fee leases at $1.25 per acre in Western Nebraska County where oil play is hot right now. Box 2181, Denver, Colo.

TENNESSEE ACREAGE
LEASES AVAILABLE FOR DEVELOPMENT—Several thousand acres with extremely interesting unrecorded geological structures and seepages. Adjacent to land leased by major oil companies. Write: E. A. Munyan, Box 572, Oak Ridge, Tenn.

WOULD offer 2,000 acres in oil and gas area, Montcalm County, Michigan, for a well or will contribute for an interest. Good geology; exchange references. Box D-521, The Oil and Gas Journal, Tulsa, Oklahoma.

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Suite 200, Grand Pacific Hotel
Bismarck, North Dakota

(Member National Oil Scouts and Landmen Association. References exchanged).

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Write or Call

A. J. (AL) WELBORN
Permian Basin Oil Properties
(25 Years in Oil Industry)
Ph.: 3-1531, P.O. Box 1032, Lubbock, Tex.
(Will be at meeting June 8-10. Skirvin Tower Hotel, Oklahoma City.)

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington New Mexico.

ANADARKO BASIN ROYALTIES
Favorably located on trend in Roger Mills Co., Oklahoma, and Roberts Co., Texas, at attractive prices. E. E. Reynolds, Herring Hotel, Amarillo, Texas.

CHOICE NO. DAKOTA MINERALS
FOR SALE: 10,000 acres of perpetual minerals in North Dakota under major companies leases paying yearly rentals. $3.00 per acre. Can sell in 200 acre blocks. Navarro Royalties Company, P. O. Box 2626, Odessa, Texas.

FEE OWNER of several thousand acres mineral title near present production. Favorable Geology. Will sell ¼ royalty interest in total acreage for sufficient to develop and agree to return the funds from first production. Box D-519, The Oil and Gas Journal, Tulsa, Oklahoma.

MONTANA ROYALTIES

Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1225, Great Falls, Montana.

ROYALTIES, LEASES, RICH WELLS
References: Investors making money, active and prices right. E. M. Adams, Marshall, Texas.

WANTED

WANTED: SURPLUS Chemicals, Oils, Waxes, Solvents, Wastes and Residues of all kinds. Chemical Service Corporation, 98-06 Beaver St., New York 5, N. Y.

WANTED: Partner for Shallow Well Drilling Rig capable of 3,000 feet. Partner must have some capital. Must be capable of making contacts and supervise drilling operations. Rig located in South Texas. Reply to P. O. Box 127, Falfurrias, Texas.

BUSINESS OPPORTUNITIES

WANT about $5,000 for small refinery deal in Montana. Abnormal returns from investment. Details — Box 2181, Denver, Colo.

I AM READY with rigs, some casing, ten year paid up leases, proven and wildcat. Need financial partner for increasing action. Write experienced operator, geologist. Post Office Box 2323, San Antonio, Texas.

FOR SALE: Complete oil well cementing equipment and business. Owner retiring due to poor health. Box D-504, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES AND RENTALS

FOR lease or rent 3030 square feet attractive office space in Frates Building, Odessa, Texas. Modern, air-conditioned and parking space. On lease basis, will arrange floor space to suit tenant. C. L. Frates, 1101 First National Building, Phone 2-6301, Oklahoma City, Oklahoma.

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Covers current developments in Federal taxes and all state and Federal court decisions affecting the industry. Issued twice a month. Subscription—$7.50 per year. P. O. Box 447, Houston 1, Texas.

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BUILT TO ORDER
FOR PRICES, SPECIFICATIONS, ETC. WRITE:
FRED R. HOLLAND
Fort Worth Club Bldg., Fort Worth, Tex.

LEGAL

United States Department of the Interior, Taholah Indian Agency, Hoquiam, Washington. NOTICE is hereby given that sealed bids will be received until 10 o'clock A. M., standard time, 11 o'clock A. M., daylight saving time, on Monday, June 26, 1950, for oil and gas mining leases on 38 tracts of restricted Indian lands, comprising 2,462.42 acres, more or less, located on the Quinaielt Indian Reservation, Grays Harbor and Jefferson Counties, State of Washington. The royalty rate will be 12½% and the annual rental $1.25 per acre. The leases are offered subject to acceptance of the bonus bids by the Indian lessors and approval by the Commissioner of Indian Affairs. The right is reserved by the Commissioner of Indian Affairs to reject any and all bids and to disapprove and reject prior to approval any lease made on an accepted bid. For legal description of all tracts offered, detailed terms of sale, lease forms, and bond requirements, write the Superintendent, Taholah Indian Agency, Hoquiam, Washington.

LEGAL

OIL DRILLING EQUIPMENT AT PUBLIC AUCTION

The undersigned, as liquidating receiver of the Carroll Drilling Corporation, a Kentucky corporation, will sell the following described property at public auction to the highest bidder at the front door of the Fayette County Court House in the City of Lexington, Kentucky, at twelve o'clock noon, central daylight saving time, on Saturday, June 17, 1950, on a credit of three months with the privilege of paying all cash, the purchasers being required to execute bonds with good surety thereon bearing interest from the date of sale, to-wit: 1. The following property located on the Collins lease in Madison County, Kentucky, said location being approximately five (5) miles west of Million, Kentucky, and ten (10) miles northwest of Richmond, Kentucky, and said location being also known as the California Company deep test well, to-wit: 1—36-L Bucyrus-Erie Drilling Machine, with 6 cylinder Buda gas, gasoline motor equipped for Butane fuel, complete with catheads, crane, 500 feet of Non-rotation casing line, 3 sheave casing block, 5 inch casing hook, Ram attachments, cat line, Derrick floor and sills, Derrick floor shed, with lots of extra sheet metal roofing, Guy lines, stakes and Turnbuckles, with all tools and fittings now located at the machine. 2. Located on the Burchell lease in Clinton County, Kentucky, near Seventy Six Post Office, approximately eight (8) miles northeast of Albany, Kentucky, to-wit: 1—36-L Bucyrus-Erie Drilling machine, with 6 cylinder gas, gasoline Waukesha sleave motor, complete with catheads, Crane, 500 feet of Non-rotating casing line, 3 sheave casing block, 5 inch casing hook, ram attachments, cat line, derrick floor and sills, derrick floor shed, Guy lines, stakes, and turnbuckles, with all tools and fittings now located at the machines. 3. Located on the Bush-White Heirs lease in Wolfe County, Kentucky, near Standing Rock, Kentucky, approximately fifteen (15) miles north of Beattyville, Kentucky, to-wit: 1—24-L Bucyrus-Erie Drilling machine, with 6 cylinder Buda gas, gasoline motor, complete with catheads, Crane, ¾ inch casing line, single sheave casing block, casing hook, Guy lines, stakes, turnbuckles, cat line, and derrick floor, with all tools and fittings now located at the machines. 4. Located on the Treadway Heirs lease in Lee County, Kentucky, on dividing ridge between Ross' creek and waters of Sturgeon Creek, near Arvel, Kentucky, which is fifteen (15) miles southwest of Beattyville, Kentucky, to-wit: 1—24-L Bucyrus-Erie Drilling machine, with 6 cylinder Buda gas, gasoline motor, complete with catheads, Crane, ¾ inch casing line, single sheave casing block, casing hook, Guy lines, stakes, turnbuckles, catline, and derrick floor, with all tools and fittings now located at the machine. 5. Located on the Tribue Heirs lease in Lee County, Kentucky, on dividing ridge between Ross' Creek and waters of Sturgeon Creek, near Arvel, Kentucky, which is fifteen (15) miles southwest of Beattyville, Kentucky, to-wit: 1—5½" Keystone "Joplin Special" Drilling machine with calf wheels, and plenty of tools to drill with. 6. Located on the Murley lease in Cumberland County, Kentucky, seven (7) miles southwest of Burksville, Kentucky, in what is known as Walsh's Bottom; also known as the California Company deep test well in Cumberland County, Kentucky, to-wit: 6,000 feet of new ⅞ inch American 6x19 Drilling cable. 4,000 feet of slightly used 9/16 inch sand line. 1—5¼" x 26" drilling stem, with 4½" box, and 3¾" pin. 1—set 6½" drilling jars with 4½" box, and 4¼" pin. 1—9" bailer. 1—7" bailer. 7. 1 Army 6x6 G. I. truck (Studebaker) with winch. 8. 1—1947 Ford truck with winch and Leland oil field bed. 9. 1 Army trailer, on the Tribue Heirs lease, in Lee County, Kentucky. 10. 1—1950 Ford Tudor sedan. The property to be sold may be inspected at the several locations above mentioned at any time prior to the sale. R. J. COLBERT, Liquidating Receiver of Carroll Drilling Corporation.

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CALENDAR

June

National Society of Professional Engineers, annual meeting, Hotel Statler, Boston, June 8-10.

National Oil Scouts and Landmen's Association, Skirvin Tower Hotel, Oklahoma City, June 8-10.

American Society of Mechanical Engineers, oil and gas power division, Lord Baltimore Hotel, Baltimore, June 12-16.

Pennsylvania Grade Crude Oil Association, Hotel William Penn, Pittsburgh, Pa., June 15-16.

American Society of Mechanical Engineers, Hotel Statler, St. Louis, June 19-21.

Canadian Gas Association, annual convention, Manoir Richelieu Hotel, Murray Bay, Quebec, June 19-24.

Kentucky Oil and Gas Association, annual meeting, Lexington, Ky., June 22-23.

Petroleum Equipment Suppliers Association, annual membership meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., June 25-27.

American Society for Testing Materials, annual meeting Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-30.

American Petroleum Institute, midyear division of production and standardization conference, Brown Palace Hotel, Denver, June 26-30.

July

Institute of Petroleum, oil shale and cannel coal conference, Glasgow, Scotland, July 3-7.

Pacific Coast Gas Association, annual convention, Seattle, Wash., July 31-August 3.

August

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

September

National Chemical Exposition, Chicago Coliseum, Chicago, September 5-9.

American Institute of Chemical Engineers, regional meeting, Minneapolis, September 10-13.

American Society of Mechanical Engineers and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

Instrument Society of America, annual instrument conference and exhibit, Memorial Auditorium, Buffalo, N. Y., September 18-22.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 24-28.

October

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, Mid-Continent meeting, Roosevelt Hotel, New Orleans, October 4-6.

American Association of Oilwell Drilling Contractors, annual meeting Mayo Hotel, Tulsa, October 9-10.

Petroleum Branch, American Institute of Mining and Metallurgical Engineers, West Coast meeting, Elks Club, Los Angeles, October 12-13.

Permian Basin Oil Show, Odessa, Tex., October 19-22.

November

Mid-Continent Oil and Gas Association, Louisiana-Arkansas Division, annual meeting, Roosevelt Hotel, New Orleans, November 2-3.

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month. Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

New York Nomads: June 27, golf party, Ardsley (N. Y.) Country Club.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that 120 acres of land in T. 32 S., R. 23 E., M.D.M., California, within the known geologic structure of the Midway field, will be offered as a single unit for oil and gas leasing, through competitive bidding, at 1 p.m. Daylight Saving Time, June 28, 1950, when bids will be opened. The details of the lease offering, how and where to file bids, and a description of the lands may be obtained by addressing an inquiry to the Manager of the Land Office, Sacramento, California, or to this office. Marion Clawson, Director.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the SE¼SE¼ sec. 22, T. 19 S., R. 33 E., N.M.P.M., New Mexico, 40 acres, within the known geologic structure of the Tonto field, will be offered for oil and gas leasing, through competitive bidding, at 2 p.m., E.S.T. June 14, 1950, when bids will be opened. The details of the lease offering and how and where to file bids may be obtained by addressing an inquiry to the Manager of the Land and Survey Office, Santa Fe, New Mexico, or to this office, Marion Clawson, Director.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the SE¼ sec. 28, T. 28 S., R. 28 E., M.D.M., California, 160 acres, within the known geologic structure of the Kern River field, will be offered for oil and gas leasing through competitive bidding at 2 p.m., E.S.T. June 14, 1950, when bids will be opened. The details of the lease offering and how and where to file bids may be obtained by addressing an inquiry to the Manager of the Land Office at Sacramento, California, or to this office. Marion Clawson, Director.

LEGAL

UNITED STATES, DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that 9 units of land containing in all 1560.39 acres in Ts. 6 and 7 S., Rs. 21 and 22 E., P.M., Montana, within the known geologic structure of the Dry Creek field, Montana, will be offered for oil and gas leasing through competitive bidding at 2 p.m., E.S.T. on June 14, 1950, when bids will be opened. Details of the lease offering, how and where to file bids and a description of the lands may be obtained by addressing an inquiry to the Manager of the Land and Survey Office, at Billings, Montana, or to this office. Marion Clawson, Director.

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SURVEYS reveal an appalling misunderstanding among young people of the "facts of business life." For example, a poll was made among seniors in certain high schools which showed that they believe business profits are "over 50%" of the sales dollar, where actually profits average less than 8%. These students also think that stockholders receive 24% of the sales dollar, where actually it runs less than 3%.

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